

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1977 by Computerworld, Inc.

lo. 38

September 19, 1977

75¢ a copy; \$18/year



A computer is helping guide America's Cup defender Courageous, shown here (background, U.S. 26) opening a lead on challenger Australia last week.

Micro Challenges Tradition At America's Cup Races

By E. Drake Lundell Jr.
CW Staff

NEWPORT, R.I. — A century of sailing tradition is being challenged here during the 23rd America's Cup Challenge Races as an outsider gained the role of helmsman for the American defender Courageous and computers moved on board many of the contending yachts.

Ted Turner, who is sailing Courageous, clearly does not fit the image of the aristocratic gentleman yachtsman and in fact has been called the "mouth of the South" along the docks here.

Likewise, the computer system aboard Courageous that handles most of its navigation functions hardly fits the traditional image of a navigator clutching a compass in one hand and a pile of charts in the other.

But while the brash advertising executive from Atlanta may not set the style for future America's Cup helmsmen, the computers are clearly here to stay.

Of the two boats in the finals for the cup here this week, the Courageous is clearly the most computerized; 50% of the half-dozen original contenders, however, placed a great deal of reliance on computer systems.

The computer system aboard Courageous is based on an LSI-11 microprocessor from Digital Equipment Corp. and uses specially designed digital input units from Signet

Instrument Co. and a hand-held terminal from Termiflex Corp., according to Bill Jorch, Courageous navigator.

Its competitor in the final best-of-seven series — the Australian yacht Australia — relies, on the other hand, on analog instrumentation and hand-held programmable calculators for its navigational duties, sources here said. The Australian challengers said they would rather not talk about equipment aboard the boat until the races end.

(Continued on Page 6)

Technology or Applications More Crucial to Growth?

By Edith Holmes
CW Staff

WASHINGTON, D.C. — Which is the greater driving force behind the growth of the computer industry — technological advances or applications development?

The answer is technology, according to Isaac Auerbach, president of Auerbach Publishers, Inc. of Pennsauken, N.J. Speaking at the Fifteenth Computer Society International Conference, Compcon 77, sponsored by the Institute of Electrical and Electronic Engineers here recently, Auerbach made special note of the promises and problems associated with memory

Alternatives Catch Eye, Not Buy, of IBM Users

Almost all large IBM computer users have considered switching to alternative mainframes and two-thirds have gone as far as evaluating the independent CPUs, according to a *Computerworld* survey of 370/158 and 370/168 users.

However, while the users are apparently willing to at least look at the alternatives, less than one-fourth are actually switching from IBM systems.

In the survey, 97% of the users said they had considered the alternatives from Amdahl Corp. or Itel Corp.; the rest — only 3% — indicated they were such confirmed IBM shops they would not even consider switching.

Of the sample, 65% had carried their considerations as far as an evaluation of the alternative equipment; 23% said they were going to switch and 61% said the evaluation had convinced them to stay with IBM. The remaining 16% have not yet made a decision on the alternative equipment.

Cost advantages and better delivery schedules were cited as reasons for switching to an Amdahl CPU, although those fortunate enough to be listed for early Model 3033 processors from IBM said delivery was not a criterion for them.

Several users who decided against an alternative system said they had reservations about support from the non-IBM vendors and also doubted these systems could offer full software interchangeability.

Ford Motor Co. in Detroit — one of the users that decided to switch — has scheduled installation of an Amdahl 470V/6-II mainframe for November. The company made an evaluation of alternative systems when the lease on its 370/165 was nearing its end, a spokesman said.

The Amdahl machine was evaluated

against an IBM 3033 CPU and found to have two advantages: it offered cost savings and it could be delivered sooner than the 3033.

The Ford DP center that will install the Amdahl CPU will swap the 165 for the 470 while keeping presently installed peripherals. These include Storage Technology Corp. tapes and disks and Memorex Corp. disk drives.

This is the first article in a three-part survey of users' attitudes toward alternative CPUs, distributed processing and IBM's Systems Network Architecture (SNA) by Jeffry Beeler, Ronald A. Frank and Molly Upton.

One of the benefits of switching to the Amdahl machine is that the DP center can continue to operate with IBM's MVT operating system. The 3033 would have required an immediate upgrade to MVS, but the Amdahl 470 will operate with MVT and give Ford the option of upgrading to MVS at any time, the spokesman said.

Hallmark Cards, Inc. in Kansas City, Mo., also has been looking at Amdahl CPUs as alternatives to its dual 168s, according to Ron Schmidt, senior technical services analyst.

The company evaluated an Amdahl 470V/6 against the IBM 168 and found the 470 had about 1.4 to 1.8 times the processing power at about 10% to 12% less money on a price-performance comparison, Schmidt said.

Performance and support of the Amdahl CPU appears to be equal to that provided by IBM, he added, but delivery advantages seem to be getting reduced because Amdahl deliveries are "getting further out."

Comparisons with Itel processors were described as "less impressive." Control Data Corp.'s Omega systems were designed more for the smaller 370 systems, he added.

R.L. Babcock, information processing manager for the Joseph Schlitz Brewing Co., admitted that his company has toyed with the idea of replacing his company's 168 with an Amdahl machine (he doesn't remember the model number), but said the Milwaukee-based firm has never seriously considered the option.

Because the brewer was on the verge of installing a new IBM 168 when it met with Amdahl representatives, Schlitz officials saw no point in taking the time and trouble to evaluate equipment. Instead, they merely discussed the financial pros and cons of replacing the IBM mainframe with Amdahl hardware, Babcock said.

Schlitz purchased its 168 very recently. (Continued on Page 4)



THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

TM reg. U.S. Pat. Off.

EDITORIAL

Editor

Deputy Editor

Managing Editor

Associate Editor

Associate Editor

Associate Editor

Assistant Editor

Computer Industry

Editor

Washington Bureau

Staff Writers

Chief Copy Editor

Copy Editors

Photography Editor

Editorial Assistant

Editorial Cartoonist

Bureaus:

London

Munich

Asia

Contributors:

Education

Legal

Taylor Reports

Human Connection

SALES

Vice President/

Marketing

Advertising

Administrator

Display Advertising

Classified Advertising

Recruitment

Advertising

Sales Promotion

Director

Market Research

CIRCULATION

Vice-President/

Circulation

Circulation Manager

Customer Service Rep

Assistant

PRODUCTION

Manager

Supervisor

Assistant Manager

Typesetting Supervisor

Donna Turnbull

Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5800.

Telex: USA-92-2529

OTHER EDITORIAL OFFICES: England:

Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-

2248/9; Telex: 264737. W. Germany:

Computerworld, c/o Computerwoche GmbH, 8000

Munich 40, Tristanstrasse 11. Phone: 36-40-

36/37. Telex: 521530. Asia: Computerworld,

c/o Dempa/Computerworld Company, Dempa

Building, 1-11-15, Higashi Gotanda 1-chome,

Shinagawa-ku, Tokyo 141. Phone: (03)

445-6101. Telex: J2424461.

Second-class postage paid at Boston, Mass., and

additional mailing offices PN127420. Published

weekly (except: a single combined issue for the

last week in December and the first week in

January) by Computerworld, Inc. Copyright

1977 by Computerworld, Inc. All rights reserved.

Reproduction of material appearing in

Computerworld is strictly forbidden without

written permission. Send all requests to Walter

Boyd.

75 cents a copy: U.S.—\$18 a year; Canada and

PUAS—\$28 a year; Europe and Middle East—

\$50 a year; all other foreign—\$65 a year. Four

weeks notice is required for change of address.

Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm

microform through University Microfilm Int.

Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor,

Mich. 48106. Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

COMPUTERWORLD, INC.

Board Chairman/

Publisher

President

VP-Marketing

VP-Finance

VP-Circulation

E. Drake Lundell Jr.

Ronald A. Frank

Nancy French

Donald Leavitt

Esther Surden

Molly Upton

John P. Hebert

Frank Vaughan

Toni Wiseman

Edith Holmes

Catherine Arnst

Jeffry Beeler

Cheryl M. Gelb

Barbara T. VanScoyoc

Susan Gerrard

Ann Dooley

Denise Petski

Jim Orton

Roger Frampton

Hans-Jurgen Ballnath

Hidetsuna Sasaki

J. Daniel Couger

Roy N. Freed

Alan Taylor

Jack Stone

Roy Einreinhofer

Terry Williams

Mary Anne Furlong

Frank Collins

Kathy Steinberg

Jack Edmonston

Kathryn V. Dinneen

Margaret Phelan

Barbara Jeannetti

Peggy Kelly

Maureen Burke

Lee Vidmer

Henry Fling

Peter Holm

Donna Turnbull

Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5800.

Telex: USA-92-2529 OTHER EDITORIAL OFFICES: England: Computerworld Publishing Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9; Telex: 264737. W. Germany: Computerworld, c/o Computerwoche GmbH, 8000 Munich 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 521530. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: J2424461.

Second-class postage paid at Boston, Mass., and additional mailing offices PN127420. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc. Copyright 1977 by Computerworld, Inc. All rights reserved. Reproduction of material appearing in Computerworld is strictly forbidden without written permission. Send all requests to Walter Boyd.

75 cents a copy: U.S.—\$18 a year; Canada and PUAS—\$28 a year; Europe and Middle East—\$50 a year; all other foreign—\$65 a year. Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

COMPUTERWORLD, INC.

Board Chairman/

Patrick J. McGovern

W. Walter Boyd

Roy Einreinhofer

William P. Murphy

Margaret Phelan

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, MA. 02160.



In Antitrust Testimony Witnesses Agree: IBM a Monopoly

By Catherine Arnst

CW Staff

NEW YORK — After two years of presenting evidence, the government is providing some conclusions to the court in the U.S. vs. IBM antitrust case. The noteworthy point is that the conclusions of an industry observer who did not want to testify for the government closely paralleled those of the government's chief economic adviser for this lawsuit.

It is not surprising that Dr. Alan K. McAdams, a Cornell professor who has been working on this case since 1971, testified IBM erected significant barriers to entry to maintain its alleged monopoly position in the computer industry [CW, July 11, 18]. He helped prepare the pretrial brief and was naturally expected to make an anti-IBM analysis when he took the stand.

Observers were not so certain of the testimony of Frederic G. Withington, an Arthur D. Little, Inc. consultant who fought the government subpoena until the week before he appeared in court. One might have assumed that Withington, who testified after McAdams, would have been predisposed against the government's case. Instead, he may have been the Justice Department's best witness by substantiating McAdam's testimony [CW, Aug. 8, 22, 29].

Both men testified extensively on the subjects of market definitions and barriers to entry. With the first subject they were in almost complete agreement except for some semantic distinctions.

The computer mainframe market can be broken down into four subsections — scientific, general-purpose, small business and special-purpose computer systems, according to both men. The general-purpose computer system market is the largest subsection and IBM has 68% of that market, Withington said.

By dominating that market, IBM can control the other subsections as well as the plug-compatible peripherals market, testimony indicated. Users can

utilize large general-purpose computer systems to do scientific applications, but scientific computers do not have the appropriate software to do business applications, thus limiting that market.

Because it dominates the largest subsection of the industry, IBM can also erect barriers that block entry into the entire industry, both Withington and McAdams testified. Both dwelled on "software lock-in" as one of the more substantial barriers to entry.

IBM initiated software lock-in with

Analysis

its first systems in the early '60s, thus tying users to IBM systems because a switch to another manufacturer's computer requires scrapping the existing programming. IBM had a large installed base at that time because of its substantial punch card business; once these users switched to IBM computers, they tended to stay there.

This barrier to entry was cemented into place when IBM announced its 360 line, which promised a series of fully compatible systems, making it easy for users to upgrade from one IBM system to another.

Accordingly, for another manufacturer to effectively compete with IBM, it too must provide a full line of compatible systems, Withington asserted.

The competitor must also provide a large maintenance and support force with at least 100 regional offices, enough internal capital to support leasing and a line of plug-compatible peripherals broad enough to cover any type of application the user may want, Withington said. These are necessary because the industry giant has them and so established them as prerequisites for market entry.

Withington estimated the cost of entering the general-purpose market in 1977 would be \$400 million.

McAdams, the economist, gave the theory behind Withington's observa-

tions. The test of a truly competitive market is the ease of both exit and entry, he testified.

If Withington's estimates were correct (and they were nearly identical to IBM estimates for market entry), then the market is monopolized, according to McAdams' criteria.

Only the largest and most well-established firms can even hope to successfully enter the computer market, he said. Even then, there is a good chance they won't succeed, as evidenced by the failures of General Electric, RCA, Singer and Xerox. These companies also proved the difficulty of exiting the market, as all suffered substantial losses by leaving.

A crucial element of McAdams' testimony was his observation that a monopolist has power over price and will raise or lower that price to contain competition, rather than to benefit the consumer. IBM always maintained a high profit margin for its products and, when it felt threatened by a competitor such as Memorex, would drop that price to the "Death Level," McAdams said.

"Death-level pricing" was the term used in an internal IBM document to describe the level to which a price can be lowered to cause a competitor to lose money if he tries to match it. The strategy was used time and again in the peripherals market, according to government charges.

Withington's description of IBM's pricing policies indicated he agreed with McAdams' view of the corporation's power over price. He insisted, even under intensive cross-examination, that IBM's motivation for lowering prices was to destroy competition.

The witness gave the same reason for most of the technological changes that IBM has developed, even though some of them have benefited the user.

As an example, he cited IBM's May announcement of its Model 3033 central processor, which he felt was obviously meant to stop competition from Amdahl Corp.'s 470V/6.

On the Inside This Week

NEWS

Congress Eyed as Right AT&T Antitrust Forum	5
State Picks New Group to Weigh Medicaid Bids	7
Financial System to Straighten N.Y.'s Books	9
Programming Called 'Natural' Field for Blind	10
CRTs Help Drive-In Tellers Catch Forgers Red-Handed ..	11
Editing System Expected to Save House \$2 Million	12

EDITORIAL

Editorial: Do We Really Need It?	14
Human Connection: Team Research Alive	15
Taylor Report: Loophole in Australian Law	15

SOFTWARE & SERVICES

'TMS' Builds, Updates, Accesses Tables	31
'CPS' Gives Mathematical Program Support	32
Cost to Reshape User System Can Be Forecast	33
Users Can 'Own' Data in Distributed Data Bases	34
Software Key to Sessions in New York	38

COMMUNICATIONS

X.25 Seen Awkward for Data Net Users	41
Clients Do Own Banking With Wall-Mounted 'Teller' ..	43
SNA-Based Net Links Mexican Bank Branches	44
Services Firm Credits Net With Revenue Rise	45
CRT Does Publishing Jobs	48

MINIWORLD

System Sniffs Out Savings	57
Video Unit Fits DG Minis	58
Dual Minis Offer Process Control	

Strong Executive Role Urged in New OTP

By Edith Holmes

CW Staff

WASHINGTON, D.C. — President Carter's plan to move the Office of Telecommunications Policy (OTP) out of the White House and into the Department of Commerce under a new assistant secretary provides a "unique" opportunity for the executive branch to develop a strong leadership role in communication and information policy, the Aspen Institute and industry members told Congress here recently.

Appearing before Rep. Jack Brooks' (D-Texas) House Subcommittee on National Security and Legislation, Glen O. Robinson, a special adviser to the institute, added, "We would be disheartened if this opportunity evaporated from neglect or timidity in providing a purposeful mandate to the new office of the Assistant Secretary for Communication and Information."

Robinson and Paul G. Zurkowski, president of the Information Industry Association (IIA), agreed with congressional and industry criticisms leveled at the President's reorganization team in recent weeks for its failure to specify what responsibilities the new Assistant Commerce Secretary and his office will have [CW, Aug. 15].

"Our guiding premise is that the assistant secretary should have a clearly defined policymaking role, with a clear specification of his or her policy domain," Robinson said.

First, the new office, created by the merger of OTP and the Office of Telecommunications (OT), won't be able to attract the high-level talent it needs to infuse the communication and information area with "a competence and professionalism" so badly needed, Robinson said.

Second, without a clear mission statement, the office can't be organized well internally, he added.

Finally, and "possibly the most important failure of all," the office will suffer "the awkward and embarrassing inability to relate to the other executive agencies that deal with communication and information policy," he stated. Robinson predicted that in the absence of a well-defined role, the assistant secretary could never be the President's principal spokesperson in these fields.

Urged Rewrite Support

The Aspen Institute representative urged Brooks and his House Government Operations Subcommittee to support the rewrite of the executive and departmental orders — the two documents which define the authority the assistant secretary and his office will have.

During the hearing, Congressman Brooks strongly expressed his desire to leave these orders alone.

Brooks suggested the executive branch "might write in all kinds of duties I won't agree with" if it is allowed to revise the orders. "I'm very cautious about executive orders," he added.

Arguing that there is no legal requirement to retain the present Executive Order 11556 which defines OTP's duties, Robinson said the departmental order is really the key to the new office's success.

Calling the new office the "National Communications Agency," for want of another name, he suggested its communication and information arms would be on a par with each other. The new agency would be responsible for formulating domestic communication and information policy relating in the private and public sectors.

The Commerce Department agency would also be in charge of setting international communications and information policy, under the Aspen scheme. This would include policies involving the industry structure and performance of the U.S. international communication carriers.

Policy formulation in the area of exports and imports of information and communication technologies and ser-

vices and their domestic and foreign social and economic impacts would be still another field within the agency's realm of responsibility, Robinson said.

The Aspen Institute would have the national communications agency conduct a research program on the characteristics and uses of communication and information technologies and resources. The agency would also support the federal agencies in their procurement, system planning and implementation of these technologies, Robinson stated.

The new agency would be in a position to recommend to the Office of Management and Budget (OMB) policies for the procurement of communication and information technologies and services, he added. It

would also be charged with the coordination of plans and programs to mobilize the nation's public and private communications and information resources in the event of a national emergency.

Like Robinson, Zurkowski of the IIA supported the opportunity for change provided by the reorganization of OTP and the creation of the new Assistant Commerce Secretary.

The new assistant secretary should have a deputy for information policy, Zurkowski stated. In addition, some of the computer policy roles of the Office of Science and Technology in the Commerce Department should be delegated to the new office as well, reflecting the overlap between these technologies, he added.

Life of Georgia Depends on ADR's ROSCOE® For Faster Job Turnaround, Faster Maintenance and Expanded System Access

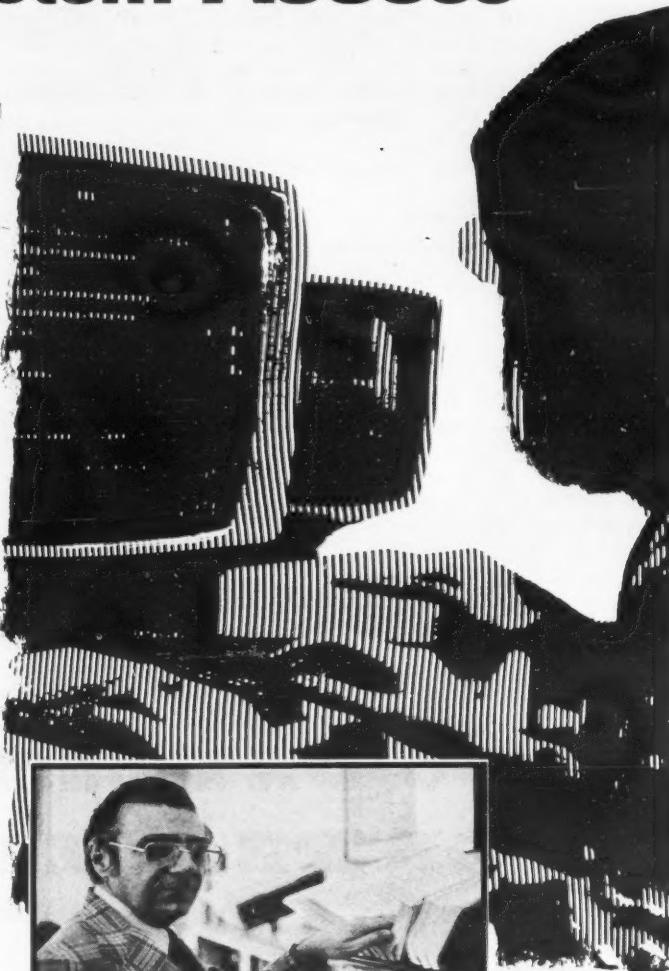
Two years ago, Life Insurance Company of Georgia installed ROSCOE, ADR's on-line conversational programming system. It was initially installed to speed computer program development, but Life of Georgia quickly found that ROSCOE also expanded direct computer access. Interactive procedures made the system easy to use without extensive training so that virtually any department could enter and update data through their own terminals. Self-prompting routines, using ROSPROCs, could direct users through even complex systems one step at a time. Information could be entered without keying-in locations or other detailed instructions, and corrections could be easily entered right over the old information, without re-keying whole data.

Today, nine ROSCOE equipped terminals are located throughout the company, giving many departments direct on-line access to 3400 operating programs. System specialists no longer wait in line to do a routine job.

Program development goes faster, too. With data-set recall, programmers call up the information they need, key-in required changes, and send it back again — without handling cards or paging through listings. "The greatest time savings comes from compiling COBOL programs," noted Earl Ryan. "ROSCOE asks the user what he wants to do and then tells him to enter the changes he wants to apply. As a result, turnaround time has been reduced at least 30%. And we have virtually eliminated JCL type errors."

"If we were to put our programmers back on the old keypunch system, we would have a real morale problem. It would be very difficult to take ROSCOE away now," Earl Ryan added.

Each ADR product is not just a program but a complete package with full documentation and on-site support. ADR is the only software company with 50 branch offices and representatives in over 30 countries — each staffed with ADR-trained technicians.



"It would be very difficult to take ROSCOE away now . . ." Life of Georgia Technical Analyst, Earl Ryan, speaking about ADR's on-line conversational programming system.

For more information on what ADR software can do for you, call or write

APPLIED DATA RESEARCH THE ON-LINE SOFTWARE BUILDERS™

Route 206 Center, Princeton, N.J. 08540, Phone: 609-924-9100

ADR software products: in use at over 6000 installations worldwide. U.S. offices in Boston (617) 245-9540, Chicago (312) 694-2244, Cleveland (216) 826-0190, Houston (713) 526-3188, Los Angeles (213) 826-5527, New York (212) 986-4050, Princeton (609) 924-9100, San Francisco (415) 391-0690, Washington, D.C. (703) 281-2011. Foreign offices in Australia, Austria, Belgium, Brazil, Canada, Denmark, England, Finland, France, Germany, Holland, Hong Kong, Israel, Italy, Japan, Korea, Malaysia, Mexico, New Zealand, Norway, Philippines, Portugal, Puerto Rico, Republic of South Africa, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, Venezuela.

Member SIA Software Industry Association

Large IBM Users Browsing But Not Buying Alternatives

(Continued from Page 1)

cently, company officials are not inclined at this point to seriously consider installing an IBM replacement.

William Shine, senior vice-president of the Chase Manhattan Trust Department in New York, said his bank has considered both Amdahl and Itel machines as replacements for its 168. But, he added, the bank has decided against those alternatives.

The alternatives might have more appeal for the bank if they were intended for internal applications only. Unfortunately, the current computer system is for customer service applications, so the reliability of that system — or any replacement — is paramount, he explained.

Shine also expressed concern about the replacements' software. Theoretically, he said, the Amdahl and Itel software is interchangeable with IBM's, but in practice there are inconsistencies.

Sticking With IBM

Bill Fore, manager of the technical staff group for Sun Information Services in Dallas, said his firm looked at Amdahl's 470V/6 about a year ago, but decided on a 370/168 instead.

Sun stayed with IBM, he said, because there was a question of service with the Amdahl unit. Further, Sun got a good financial deal, so the difference in cost between a 168 on a long-term lease and the 470 "didn't seem to warrant the exposure and risk," Fore said.

In addition, Sun was running flat out; the company was in a transition period and didn't have software people to spare should the Amdahl need some special attention, he said.

Ralston Purina Co. in St. Louis didn't really consider Amdahl or other IBM alternatives because it got very good delivery dates on the two 3033s it ordered, according to Chuck Childers, general manager of computer services.

The IBM machines are due in September and December of 1978, he said, and the firm is investigating a package deal which would involve subleasing the 168 and 158 it has from Itel and arranging a long-term lease on the

3033s.

Ralston Purina has had IBM CPUs since 1966, although it has gone to other vendors for nearly everything else, including about 300 Univac Uni-scope terminals which it links with IBM's IMS through its own teleprocessing program.

The firm has converted to MVS, according to Childers, who praised such capabilities of the system as resource management, more than 15 initiations and more concurrent jobs, as well as the ability to use new IBM peripherals.

But using MVS is also "a matter of keeping pace," Childers said. IBM plans to drop support on MVT.

With MVS, the firm has discovered some application program dropout. Although MVT tolerated various deviations from specifications in the programs, MVS didn't, he said.

Waiving on 470

Jeff Dunn, assistant DP director of Northwestern Mutual Life Insurance in Milwaukee, said his firm has considered replacing its 168 with an Amdahl 470V/6-II. In fact, the company already has placed an order for the Amdahl machine, but Dunn and his colleagues have not yet decided whether to confirm the order.

Dunn cited improved delivery as one reason Northwestern is considering replacing its IBM mainframe. If they confirmed the Amdahl order, company officials could expect delivery by the third quarter of next year.

Goodyear Tire and Rubber Co. in Akron, Ohio looked "lightly" at Amdahl's 470V/6, but made no decision to go with it. At the time Goodyear was looking, Amdahl had only about 30 installations, many of which were in university and government environments, according to John Longstreth, manager of DP support services.

The firm has no plans to reconsider Amdahl at this time, he said.

Monsanto Co. in St. Louis has looked at Amdahl's V6 and V7, but not really seriously because management has not indicated a desire to go outside of IBM for equipment, according to Frank X. Fallert, manager of performance

Comment Deadline Extension Delays Computer Inquiry Again

WASHINGTON, D.C. — The Federal Communication Commission's (FCC) second Computer Inquiry has been stalled a second time.

The latest delay to the year-old inquiry into the definition of data processing and potential DP service offerings by common carriers occurred when IBM requested the date for filing reply comments be extended from Sept. 12 to Oct. 14.

The initial holdup of the comment portion of the Inquiry came when AT&T asked for a 90-day delay of the due date for participation — from July 25 to Sept. 12.

In both cases, the corporation involved is preparing a study to accompany its comments as an appendix.

IBM's "expert study" will be on "the effects of public utility regulation in a competitive environment," the corporation told the FCC.

Because they had already granted an extension of time for AT&T, the FCC commissioners felt they could do no less for IBM and thus moved up the deadline for filing reply comments to Monday, Oct. 17.

Some 80 participants in the Inquiry submitted comments on the FCC's proposed definition of Data processing last June 6 [CW, June 13]. The reply comments represent the second round of participation by users, trade associations and industry members.

analysis.

Monsanto has gotten as far as recognizing the existence of Amdahl, he added.

Firestone Tire & Rubber Co. has flirted briefly with the idea of installing an IBM replacement, according to the company's operations manager, H.W. Guthrie. But the Akron, Ohio firm never seriously followed through with the hardware installation.

Guthrie said Firestone's central computer system incorporates hardware from IBM competitors like Itel, so to dismiss Firestone's DP department as an all-IBM shop would be misleading. When it comes to CPUs, however, the company likes to avoid mixing equipment, the manager explained.

Firestone evaluated Amdahl equipment as a replacement for its IBM 158, but Guthrie said he didn't remember the model number of the potential alternative.

Leo Harris, operations manager for Blue Cross/Blue Shield in Richmond, Va., said that firm "briefly" considered replacing its IBM 158 with an Amdahl 470V/5 or 470V/6, but eventually decided against the switch.

Harris described his firm as "very conservative" and admitted company officials had expressed some concern about Amdahl's long-term viability. "Amdahl is still essentially a one-product company," Harris said.

If Amdahl gains a larger market saturation and wider product line, Blue Cross/Blue Shield would feel more confident about its long-term survival prospects, he added.

PPG Industries, Inc. has not seriously considered replacing its three IBM 158s with Amdahl, Itel or CDC hardware, according to D.L. Campbell, director of the company's computer center.

PPG is very conservative in its organization and corporate policy, Campbell explained, and has already committed itself strongly to IBM equipment. This commitment sometimes causes problems for the company, but it has the advantage of being safe, he said.

Ashland Oil in Ashland, Ky., is considering an Amdahl 470V/6, but Stan Wonn, administrative assistant for computer science and services, said the firm is a heavy IBM user.

Ronald Leone, data center manager for Sears Roebuck Co. in Philadelphia, said Sears has "tinkered with the idea" of replacing the firm's 158 with one of the IBM alternatives, but "has done

nothing serious" about the matter. He doesn't know which of the alternatives the company has evaluated because most of the decision concerning computer equipment selection are made at Sear's Chicago headquarters.

Amoco Production Co. has considered replacing its IBM 168 with an Amdahl 470V/6 CPU, but the firm has not yet decided whether it will make the equipment switch, operations manager William Caldwell said.

Because Amoco is still in the early stages of evaluating the IBM replacement, it is unable to say at the moment what the potential advantages and disadvantages of the Amdahl hardware are.

No Switch Considered

J.C. Penney Co. has not considered switching to the IBM replacements because the Wauwatosa, Wis.-based firm wants to avoid the problems that arise from having too many different kinds of equipment at the same site. Penney already uses IBM peripherals at the Wauwatosa data center.

Nor has Oscar Mayer Co. considered switching from its 158 to the IBM replacements, according to Roger Tietz, the company's computer manager. The Madison, Wis.-based firm considers itself an IBM shop and plans to maintain that status for some time to come, Tietz explained.

But Prudential Insurance Co. of America in Roseland, N.J., not only evaluated the Amdahl 470V/6, but installed one in addition to its 370/168 about eight months ago, according to Mike Capo, shift supervisor.

The 470V/6 was selected for teleprocessing duties because it was faster than a 168, John Richards, system programmer, indicated.

"Overall we've been very impressed with it," Richards said. Capo noted the system had been subject to some downtime, but said it does the work of a 168.

R.N. Wehling, technical services manager of Alcoa Aluminum in Pittsburgh, Pa., said his company has not considered replacing its 158 with any of the IBM alternatives. He said the firm already owns its mainframe and plans to use it for a while.

Bud Patterson, production manager of Union Carbide's Chemical Division in South Charleston, W. Va., refused to disclose whether his company has considered replacing its 168 with IBM alternatives. He said that information is confidential.

IBM 3270 USERS GET 60 DAY DELIVERY ON PRINTERS

Interface Systems' 30 cps to 180 cps printers are 100% compatible (hardware and software) with IBM 328X printers but run faster and cost less. If you need to save money (purchase prices as low as \$3,400), or need extras like:

- large 9 x 7 dot matrix for better readability
- better forms handling, 3" to 14" widths
- vertical forms control
- large size characters or bar code
- super reliability
- nationwide service

Call or write us for detailed information at:

INTERFACE SYSTEMS, INC.
462 Jackson Plaza
Ann Arbor, Michigan 48103
(313) 769-5900

Bell's Remark Stirs Debate

Congress Eyed as Right AT&T Antitrust Forum

By Ronald A. Frank
And Edith Holmes

CW Staff

WASHINGTON, D.C. — A recent suggestion that the AT&T antitrust trial should be decided by Congress instead of the courts has drawn opposition statements from several communications organizations.

The suggestion was made by U.S. Attorney General Griffin Bell in an interview with *Fortune* magazine in which Bell said the AT&T suit should be handled by Congress.

Several organizations, including the Independent Data Communications Manufacturers Association, the North American Telephone Association and Phonetel Inc., have taken issue with Bell, while AT&T has registered its general approval.

The attorney general has proposed on several occasions — most recently in the *Fortune* interview, scheduled for publication in November, that big antitrust cases involving a restructuring of an economic system "would perhaps be better... done by Congress than by a single federal judge."

The final judgment, the attorney general acknowledged, would be political. But why not, when most economic decisions on behalf of the U.S. are politically based? he asked.

Interest Waning?

A Justice Department spokesman, contacted for clarification of Bell's remarks, denied Bell's remarks signal the department's interest in the case is waning.

"We are committed to trying the AT&T case in court. Bell and John Shenefield [acting assistant attorney general] are doing everything possible to expedite the case," he said.

"Bell has no intention whatsoever of taking AT&T to Congress," the spokesman added.

Bell simply used the AT&T case as an example of the kind of antitrust suit so closely involved with economic and social issues that might be settled by Congress in the future, the spokesman explained.

A spokesman for the IDCMA said, "The attorney general has apparently admitted that the antitrust laws are unworkable — at least when a very large organization like AT&T is involved."

If the attorney general simply intends to abandon the AT&T suit, his action may be interpreted as a concession to monopoly and an admission that the U.S. is powerless to do anything about it under existing laws, the spokesman said.

The North American Telephone Association (Nata), an organization of companies that compete with the telephone company, issued a statement which said that Bell "apparently based his statements on the belief that the suit will appeal will take 10 to 15 years to settle."

"Bell's statements indicate a very dangerous situation. The Justice Department has a clear mandate under the antitrust statutes of this country to prosecute any company involved in restraints of trade. Furthermore, Congress should not be asked to reaffirm its clearly established procompetitive principles on a case by case basis," Nata said.

In a speech delivered at the annual Nata convention in Washington, D.C., Sen. Gary Hart (D-Col.) said Bell's remarks could signal the state of a debate on the proper role of Congress, the executive branch and the judicial branch in promoting free market principles.

"The attorney general suggested that Congress may be the better forum for reaching what he termed "political judgments." This strikes me as an oversimplified explanation of what is wrong with our current methods of antitrust enforcement," Hart said.

"I am not sure Congress is a better forum than the courts for resolving the AT&T case. That case involves not only political judgments, but also al-

leged predatory and anticompetitive practices, which have precise judicial and legislative definitions," he said.

A more favorable comment on Bell's opinions was made by AT&T board chairman John deButts. Appearing on a recent ABC "Issues and Answers" program, deButts told an interviewer: "When you get into organizational structure of an industry, it is beyond the antitrust laws and their purpose. If you're breaking the law, you should be penalized and should have to pay a fine or maybe even go to jail."

"But from the standpoint of the total society, the reorganization of the structure of an industry goes beyond that and maybe the decision should be

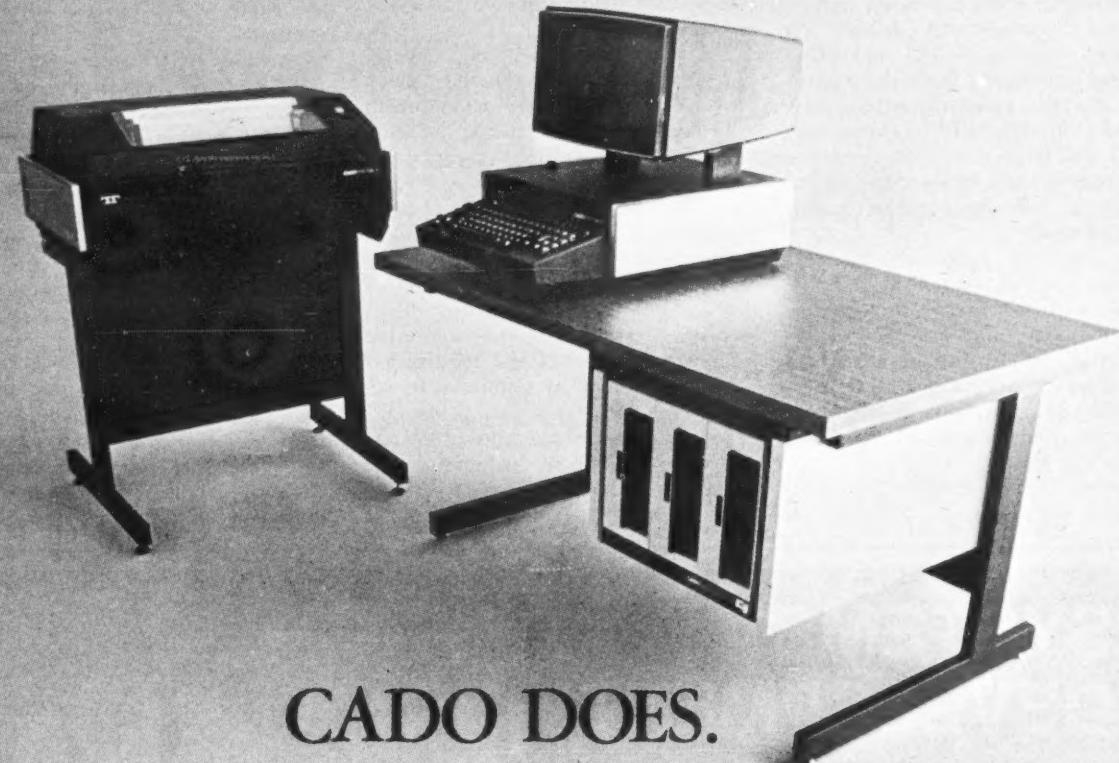
made by the Congress of the United States. And with that philosophy I agree."

As a result of Bell's comments, a letter was sent to the attorney general by Robert Feiner, president of Phone-tele, Inc.

In it, Feiner told Bell that "If you intend to refer any issues contained in your suit against [AT&T] to the Congress, then I believe it is now incumbent upon the Justice Department to investigate precisely how obligated each member of Congress may be to AT&T, et al."

Bell's statement "served no useful purpose to anyone but AT&T by fortifying its efforts in Congress."

WHO PUTS AT&T IN THE DATA PROCESSING BUSINESS?



CADO DOES.

We start with Bell System's CRT and 300 lines per minute impact printer. They're the world's most reliable and, because Bell makes so many, among the lowest in cost.

We add CADO computing power and up to 20 million characters of stored data.

Result: a remarkably intelligent and durable data processor that costs about half as much as IBM's work-alike model.

So now you have a Small Business Computer that will do all your accounting and inventory control better...for as little as \$450 a month lease purchase.

Or if you need a distributed processor (with turnkey IBM communications emulators), this is all you need. And you can put the Bell half of the system on your phone bill.

CADO SYSTEMS

Send the coupon to (or call) your nearby CADO Representative. He'll send you a free brochure on the data processor that's part Bell...part CADO...and all business!

Cado Systems

2730 Monterey Street
Torrance, California 90503
(213) 320-9660

It sounds like a Bell of an idea! Send me all I need to know about the CADO Business Computer, or the CADO Distributed Processor.

Name _____	State _____	Zip _____
Title _____		
Company _____		
Address _____		
City _____	State _____	Zip _____
Phone _____		

Technology or Applications More Crucial?

(Continued from Page 1)

"Computer technology has extended our applications horizons but those horizons are harder to achieve," he said. Techniques developed to reduce the problem of implementing applications such as interactive programming systems and program generators aren't being used to the extent they should be, according to Henson.

The IBM executive predicted that future developments in the area of applications will be "evolutionary." The industry won't see any "breakthroughs" in this field, he stated.

'More Profound' Results

While Henson applauded technological advances, he suggested that improvements in equipment price/performance ratios should result in more than the same job accomplished faster. Advancements in technology should permit "more profound things," he maintained.

Many applications include non-DP people whose part in the system is essential to its operation and so must be clearly understood, Henson said. There is a "user thrust toward operational systems" as a result, he noted.

Henson identified another class of applications — those involving technical and management forecasting modeling, end-use design and other planning functions. Both the operational and the planning applications demand more data, which often means a need for large data base systems. These systems add to the difficulty of developing the applications themselves, he said.

The problems presented by data bases, go hand in hand with those attendant with price/performance improvement in graphics and communications, Henson suggested. These technologies may have all kinds of potential uses, but their development into applications might cost more than the user can afford.

There are other problems which accompany technological advances as

well. Among them are system security, auditing and privacy, he said.

The tools needed to simplify the development of applications are available but aren't used, Henson stressed. Virtual memory, preprogrammed telecommunication controllers, chief programmer teams and structured programming are among the aides at the users disposal if he would only employ them, Henson said. Of all IBM system users, only one in seven uses interactive programming capabilities to solve problems, he noted.

Application program report generators can reduce by two-thirds the number of code steps required in a program and yet they aren't used. Instead, users continue to let an average of 85% of their programming costs be tied up in maintaining this software, Henson suggested.

The problem of efficient applications development "is serious" and "a major inhibitor to all computer users and thus to economic growth," he said.

On the other hand, the application of tools in program development should be dictated by economics, he added. "It costs more to develop and debug applications than to run them for their lifetime," Henson said, noting that 46% of IBM's programs require 2% of its computer capacity.

"It doesn't make sense to spend resources on fine tuning systems given the cost of the software development to be accomplished on them," he said.

Henson concluded that any progress in the area of applications development and hence in the growth of computing must come thorough discipline rather than breakthroughs. Programming is not an art "so individualized that it cannot be broadly controlled," Henson stressed. It must be viewed as a "pragmatic discipline" requiring a "good allocation" of resources, he added.

Henson looks to the mid-1980s and the development of automatic programming to assist the development of applications.

Auerbach suggested growth in the use of computers will stem from lower costs resulting from technological developments chiefly in the area of memories. He believes that in the next few years, users will see the cost of their processing power and internal memories diminish by one-third as the industry reaches the point at which more than a million circuits can be packed onto a chip.

The user cost of processing power and disks will go down two-thirds because of the increased densities of information that will be recorded, he predicted.

Read-only memory (ROM) promises

to make the use of firmware more widespread, Auerbach said, adding that he expects the cost of reprogramming to decrease, given electrically programmable ROMs now being developed.

Both charge-coupled devices (CCDs) and bubble memories will depend on how suitable the programming is that accomplishes them, Auerbach stated. These techniques must be shown to be competitive with moving-head disk memory, he added.

And Auerbach predicted that "significant improvements" are still accessible in moving memory technology in the areas of bit density, track density and access time.

Micro Challenges Tradition By Taking to the High Seas

(Continued from Page 1)

The Courageous system is working "pretty well," Jorch said, adding there has been "no downtime" because of the CPU even though some downtime was experienced early in the trials because of problems with the power supply, which is fed by two automotive batteries.

Admitting that Turner was initially "very negative" about the computer system, Jorch said the helmsman is "still not in love with it" since he's a "seat-of-the-pants sailor."

However, Turner has come to accept the system because it proved its worth and reliability during the grueling summer of trials for the cup, Jorch said. "He panics a little" now if the system fails to work or an instrument goes out.

Jorch, on the other hand, is very comfortable with computer systems since he is a senior engineer in computer equipment design for Grumman Aerospace Corp. when not sailing.

In one example of the system's value, Jorch said that in an early race the

power went down — and Courageous lost 20% of the lead it had gained at that point, even though it went on to win the race.

The system basically provides the navigator with position and speed information, including readouts on wind direction and speed, speed through the water and position on the course.

Previously all of these things had to be hand calculated by the navigator, taking up almost all of his time and providing less accurate information.

For example, even what would seem to be a relatively simple calculation — speed — is difficult in choppy seas aboard a 12-meter yacht. Each wave either boosts or slows the speed of the boat to some degree; with manual systems, the navigator has to use his judgement to try to determine the exact speed of the boat on the course.

The computer system, however, is constantly measuring the speed and calculating the averages, giving a more accurate readout, Jorch said.

Wind direction is another complex calculation handled by the system. About 60% of an America's Cup race is sailed into the wind with the boats tacking toward a mark.

There is an optimum angle that each boat can sail toward the wind. If the boat tries to sail closer than that angle, its speed slows; if it sails at a wider angle, it may actually go faster, but have a longer distance to the mark.

It is therefore extremely important for the navigator and helmsman to know the "true" wind direction at all times.

The computer system computes the boat angle and speed and adjusts for these in order to give the navigator a readout of the true wind direction, Jorch said.

Although computers are being used more widely here this year than ever before — with the Swedish yacht Sverige and another American contender, Independence, sporting computer systems, almost identical to the one on board Courageous — they have played a minor role in past races.

Beginning in 1970, attempts were made to use rather primitive analog computers for wind direction calculations, Jorch said, and in the 1974 series a Data General Corp. Nova system was installed aboard Courageous, which was the American boat then also.

SYSTEMS DEVELOPMENT STANDARDS

Top Manager — User — Data Processor
DESIGN, DEVELOP, DOCUMENT, DELIVER, Your System
ON TIME AND WITHIN BUDGET

CARA CORPORATION brings you a ready to use, two-volume, methodology for Systems Development which is structured in the principle of

Keeping Standards Simple

Industry Proven ? KSS HAS IT!
 State-of-the-Art ? KSS HAS IT!
 Top Down ? KSS HAS IT!
 Control Costs ? KSS HAS IT!



CARA CORPORATION
 1010 JORIE BLVD.
 SUITE 124
 OAK BROOK, IL 60521

312/654-2405

After 'Unfair Treatment' Charges State Picks New Group to Weigh Medicaid Bids

By Ann Dooley
CW Staff

BOSTON — A new selection committee has been chosen to evaluate bids for a state Medicaid system because the previous choice was disqualified after other bidders charged they were treated unfairly during the original selection process.

Blue Cross/Blue Shield of Massachusetts was originally awarded the \$19 million contract with a subcontract to Electronic Data Systems, Inc. (EDS). When other bidders complained of "unfair treatment," a review board was established to examine the selection process [CW, Aug. 8].

The board determined that some of the complaints were valid and recommended that Gov. Michael S. Dukakis reopen the bidding.

The new selection committee is already beginning work, according to chairman William O'Connor, assistant secretary of the Department of Administration and Finance (A&F). The other four members of the board are state employees, contrary to the hopes of some critics who felt members of the private sector should be included in the selection process this time.

Bidders Try Again

According to O'Connor, four of the five original bidders are bidding again — Blue Cross/Blue Shield; Pilgrim Health Applications, a subsidiary of

Backus Receives Turing Award

NEW YORK — The Association for Computing Machinery (ACM) recently named John Backus the recipient of the organization's 1977 Turing Award.

Backus, an IBM Fellow at the Research Center in San Jose, Calif., was selected for his "profound, influential and lasting contributions to the design of practical high-level programming systems, notably through his work on Fortran," the award committee said.

The \$2,000 award is ACM's most prestigious award for technical contributions to the computing community.

Development of Fortran

Backus headed a small IBM group in New York City during the early 1950s that developed "a high-level language for scientific and technical computations called Fortran," ACM continued. The group also translated the programs into machine language using "novel optimizing techniques" to generate fast machine language programs.

The award recipient also served on the international committees that developed Algol 58 and Algol 60, a later version. Algol received "broad acceptance in Europe as a means for developing programs and as a formal means of publishing the algorithms on which the programs are based," ACM continued.

Backus' present work concentrates on the foundations of programming languages in order to understand the simplest elements needed to build a programming language.

Arthur D. Little, Inc.; Planning Research Corp. and System Development Corp.

Only Citibank is not trying a second time.

The committee, which acts in an advisory capacity to the Secretary of A&F, will probably not have an opinion ready for several months, O'Connor said.

Rebidding procedures are moving slower in another controversial state contract, that one involving a \$23 million facilities management contract almost awarded to EDS [CW, Aug. 15].

The A&F contract was halted when the State Attorney General disclosed

conflict of interest between EDS and Sci-Tek Associates. Two members of the selection board that awarded the job to EDS were also employees of Sci-Tek, a firm involved with EDS in a Tennessee contract.

The companies wishing to bid again on that contract must wait for a new selection committee to be formed. But the formation of that committee hinges upon what a conflict-of-interest investigation by the Attorney General may reveal.

The investigation is expected to continue for several more weeks.

EDS has stated it did nothing wrong in working in a joint business relationship with Sci-Tek. EDS said it had

questioned Sci-Tek on the propriety of their arrangement before entering into the relationship, officials said, and Sci-Tek checked with the state and was told there would be no problem.

Relationship Okayed

The relationship between Sci-Tek and EDS on the contract in Tennessee had been approved by the state before EDS had entered its bid, John Buckley, A&F secretary, admitted.

Because the award of the Massachusetts contract was delayed, the two contracts were being negotiated at the same time and that plays a large part in the conflict-of-interest charge, Sci-Tek officials claimed.

SMALL 370's CAN HAVE A MODERN TP SYSTEM

If you are the proud owner of a 370/115 or 125 or maybe a 360/40, you will have every right to expect your computer to run an efficient and sophisticated on-line system.

SHADOW II is the world's most Advanced TP Monitor, and runs as happily on a 370/115 as it does on a 370/168.

Our medium and large size users like the enormous range of facilities provided with SHADOW II, and of course the world-renowned performance compared with any other system.

Our smaller users also appreciate these benefits of course. But they also find that their application programmers can write TP programs under SHADOW II as easily as writing in batch. And they get terrific performance without costly upgrades, because SHADOW II requires miserly quantities of Main Memory and CPU time. Just 2K of real storage under DOS VS for instance.

SHADOW II is a true Multi-tasking, Multi-threading system which allows you to grow from your first small TP applications, to your larger systems of a few years hence without a difficult and costly rewrite.

We don't ask the small user to accept an "Entry Version" with limited facilities and poor performance. SHADOW II is BIG on facilities but SMALL on resource requirements.

Get a BIG system without a BIG budget. Return the coupon for a copy of the SHADOW II Concepts and Facilities manual and a User Reference List.

Shadow II
The World's most advanced TP Monitor
altergo

Altergo Software Inc.
Wellesley Office Park
55 William Street
Wellesley
Massachusetts 02181
Telephone: (617) 237-6132

Please send me the Concepts and Facilities Manual right away.

Name _____

Title _____

Organization _____

Address _____

Zip _____ Phone _____

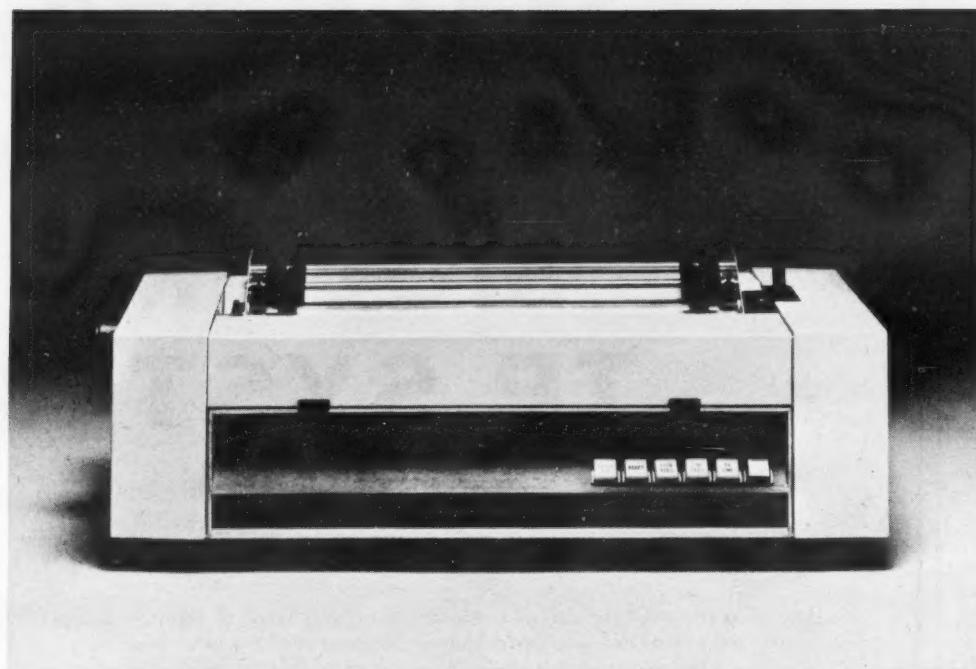
My computer is IBM _____ Op. System _____

Present TP Package _____

- Our need is immediate
 3-6 months
 over 6 months

V
1
1
3
8
S
E
P
1
9
7
7
UMI

Now you can expect even more from Lear Siegler.



Printers.

Introducing Lear Siegler's new 200 series printer.

Our revolutionary Ballistic™ printer head design makes us unique among printer manufacturers. Unlike other matrix printers, there are no solenoids, and thus no moving cores attached to the wires. The Ballistic™ head uses small "swatters" that ballistically propel the matrix wires. This simplified system has eliminated clogging with inks, dust and paper fibers - so the Ballistic™ head requires no preventive maintenance. If you have a requirement that calls for continuous printing, and the cost of service is important to you, our 200 series printers will give you the lowest cost of ownership.

Lear Siegler's new 200 series printers are designed to have at least 10 times better reliability than presently existing printers. Remarkably, the Ballistic™ heads

are capable of printing up to 1 billion characters before needing a replacement. And with a fully-buffered input for bi-directional printing, you can print an original and 5 copies at 180 cps. With no head adjustment.

Compare this with the up-to-now-best printer's head, which needs constant adjustment, and lasts only for about 100 million characters. If you were lucky. And many times you weren't.

So if you're tired of depending on luck, and need non-stop output, you owe it to yourself to look into our new printers. You'll like what you see.



Lear Siegler, Inc.,/Electronic
Instrumentation Division, Data
Products, 714 N. Brookhurst St.,
Anaheim, CA 92803; (800)
854-3805. In California (714) 774-1010.

To Integrate Budgets, Accounting Financial System to Straighten N.Y.'s Books

By Catherine Arnst

CW Staff

NEW YORK — New York's financial crisis of the past two years finally forced the city to design its first centralized financial management system, although the suggestion for one had been made at least two years earlier.

Jan Lodal, executive vice-president of American Management Systems, Inc. (AMS), designer of the system, had worked on New York's payroll system prior to the fiscal crisis in 1975 and had written studies suggesting an integrated centralized system.

When state and federal laws connected to the city's financial rescue required such a system be built, AMS was contacted again because "those studies proved right," Lodal said.

After 18 months of design and development, New York's Integrated Financial Management System (IFMS) was installed by AMS July 1.

IFMS will integrate the city's budget and accounting applications for all its agencies and the end result should be auditable financial statements for the fiscal year ending June 30, 1978.

The system runs on two IBM 370/158s and there are about 200 Genesis One G77 CRT terminals tied into the system, which allow agencies to retrieve information but not alter or input any data. All data is currently entered in a batch mode on 35 IBM 3277

terminals in a central location. Eventually, some data will be remotely entered, Lodal said.

6 Billion Bytes Storage

The system currently has 6 billion bytes of direct access storage available which will be expanded to a maximum of 12 billion. The system costs \$16 million and is budgeted to operate at a cost of \$10 million annually.

Prior to IFMS, New York's only automated financial systems were its budget, accounting and payroll systems. However, these were not integrated, according to Steven Clifford, special deputy comptroller. "There were a whole bunch of important functions that weren't being done," he added.

In December 1975, a report by Arthur Andersen & Co. highlighted some of the weaknesses in those systems.

Among those cited were: lack of controls in the overall accounting systems and procedures; fund control structures that were not useful for control of revenues, expenditures and fund balance; expenses for contracts that were not recognized until vouchers were processed.

In addition, bank balances were not reconciled for several years and information on cash balances maintained by the comptroller and the director of finance differed by several million dollars.

One of the city's problems was that the comptroller and

the mayor "were usually at each other's throats," Clifford said. To overcome that lack of cooperation, the Financial Information Services Agency (Fisa) — which is equally controlled by the comptroller and the mayor — was set up to administer the new system.

AMS was chosen to develop the system because Clifford had worked with it before and believed its personnel to be "the only people who could handle the job." City personnel and accountants from Touche Ross and Co. worked with AMS on the design.

Strapped for Time

"Our biggest problem was too little time," Lodal said. The systems contract was issued in September 1975 and the system had to be installed by July 1, 1977. That deadline was established by federal law.

"Almost nothing could be salvaged" from the existing systems and the city's accounting data was not in a standardized form. The city also never kept any inventory records of fixed assets, he added.

There was no time to accommodate the special needs of the different city agencies, Lodal said. Clifford described the system as a "top-down design. It had to be, with only 18 months to deliver."

"There was not as much input from agencies as would be expected. I wish the agencies had been more concerned," Clifford said. The result has been "numerous clerical problems and some grumbling, but I haven't paid any attention."

The system did start on schedule with only the usual start-up problems, Clifford said.

"As a big on-line system it's

certainly not systems state-of-the-art — we had no time to be daring. But we do think it is applications state-of-the-art," Lodal said.

He added that no other city has a financial system of such size and flexibility, but "New York needs the best and fanciest because of its size."

The system issues about 200 reports, through an automated report distribution system, to about 2,000 separate user groups, allowing agencies for the first time to analyze their own financial data, Clifford said.

The programming is done in Cobol and operates under an information management system (IMS) which gives it great flexibility, Lodal said. Everything in the system is controlled by master tables which are core-resident but available to the system. This makes it very easy to use.

Afips Updates 1973 U.S. DP Summary

WASHINGTON, D.C. — Computer technology is a "nonscarce" national resource that is relevant to a broad range of policy questions, according to an American Federation of Information Processing Societies (Afips) study which is scheduled for release in October.

Updating a 1973 report by Afips, *Information Processing in the United States: A Quantitative Summary* estimates that the total computer labor force is 853,000 people.

While the insurance and banking industries have the largest number of firms using computer equipment or services, the manufacturing sector is the biggest computer user in the U.S. in terms of the amount spent on equipment and services, the Afips study found.

The report, which has already been presented to the White House Office of Science and Technology Policy, predicts that U.S. firms'

world computer manufacturing and services revenues will double from \$31.9 billion in 1976 to \$64.0 billion in 1981.

Meanwhile, world computer equipment shipments for U.S. companies will also double from \$15.9 billion in 1976 to \$30.5 billion in 1981, Afips said.

Finally, the study shows that while the percentage of gross national product spent on computer usage in the U.S. is increasing dramatically, the amount spent per capita is increasing at an even faster rate.

The 85-page report updates the previous Afips study, entitled *The State of the Computer Industry in the United States*.

Intended to provide summary data on the information processing field, the report will be publicly available next month from Afips headquarters at 210 Summit Ave., Montvale, N.J., for \$6.00 per copy.

MARKETING PROS



We need more marketing pros at Interdata

Our continued rapid growth and success as a top minicomputer manufacturer have opened up new opportunities for both product and market managers. Several levels of positions currently available include:

MARKET MANAGERS experienced with OEMs and end users in the business, simulation, and scientific marketplaces. Develop market strategy, coordinate advertising, offer sales consultation, analyze competition, research markets and generally help us increase our market share.

PRODUCT MANAGERS with technical expertise, marketing savvy and experience with mini or mainframe vendors in:

- Processors—16 and 32-bit architectures, memory systems and I/O sub-systems.
- Software—OS's, Utilities, High Level Languages and Data Base Management Systems.
- Peripherals—Planning strategy with our affiliated companies, Perkin-Elmer Terminals and WANGCO, and our other peripheral vendors.
- Systems—integrating hardware packaged systems for special target markets.

Join the winning team at our attractive suburban headquarters on the Jersey Shore. Tell us about how tough you are in strictest confidence. Write or call me, Carl Whisner at (201) 229-4040.

We are an equal opportunity employer with virtually unlimited opportunities.

INTERDATA
A UNIT OF
PERKIN-ELMER DATA SYSTEMS
Oceanport, New Jersey 07757, U.S.A.

V
1
3
8
S
E
P
1
9
7
7
UMI

Programming Called 'Natural' Field for Blind

By Mary Kincaid

Special to CW

"Computer programming is a natural field for blind students to enter," according to Joyce Van Tuyl, a California transcriber whose braille transcriptions have launched a number of blind students into advanced math careers.

Van Tuyl, along with a band of other volunteers, has been a member of the California Sixth District State PTA Braille Transcription Project since 1968. A graduate of the University of Michigan College of Engineering, her sympathies lie with the thousands of gifted, intelligent blind young people who are inclined toward math and science. This is a group often turned away from their field of interest by counselors, who themselves may find math and science "impossibly difficult" and, therefore, unappealing.

Van Tuyl, who is fully sighted, signed up for the first adult education class in braille offered in Palo Alto in 1956. It was a providential choice. The tasks involved were intellectually stimulating and rewarding, and the need for trained personnel to learn the alphabet and the technique of transcribing it by machine was urgent.

15% Know Braille

Although braille transcriptions enable the blind to read textbooks, enrich their lives by reading the world's best literature, or follow new recipes from gourmet cookbooks, only 15% of the blind population knows how to read braille.

There are several reasons for this surprising statistic. Those who become blind as adults are often defeated by the enormity of their misfortune. They simply don't have the will to try to learn. On the other hand, the optimists don't want to learn because they believe their blindness is temporary.

In addition, many blind people are diabetic. They often have a reduction of the sensation of touch, preventing them from using their fingertips quickly to sense the pattern of raised dots that form the braille alphabet and other braille symbols.

During the '50s, better braille code was designed for math. The old math symbols, with positions both above and below line, and the incorporation of several foreign alphabets had prevented transcribers from using them in the rigidly coded single-line braille system used for text.

In 1952, Dr. Abraham Nemeth, now a mathematics professor at the University of Detroit, devised a way to adapt the existing braille system to incorporate modern math symbols.

Logical Link

"Computer programming," Van Tuyl said, "is a natural field for intelligent blind students, because from childhood on they have had to organize and systematize every aspect of their lives: Socks, kitchen utensils and furniture are all placed in specific places for ordered and efficient use. This is exactly the systemized procedure in which computer programmers must be trained to think. That practice sometimes even puts them ahead of sighted programming students."

A number of young Californians for whom Van Tuyl had transcribed text-

books have grown up and gone on to study advanced math. One boy received his BA in math at Stanford University, then took a Masters in operational research. Another of her students is now doing graduate work in computer science at Georgia Tech.

The Braille Transcription Project, sponsored by the Sixth District California State PTA, has been in operation for 21 years, not only training volunteers in transcription, but also in recording texts on tape.

Before a transcription is begun, a search is made with the American Printing House for the Blind, in Louisville, Ky., to see whether the requested text is already available. If not, a volunteer is assigned to the task.

Volunteers work at home on small

machines that transform printed words into the raised dot patterns on paper. If that material is to be made into a book, these pages are duplicated a second time on more durable plastic sheets that will withstand the pressure of the readers' fingertips for a longer time.

Understandably, more pages and more labor hours per page are required to produce a book in braille than in print. The Transcription Project has produced such time-consuming volumes as Roget's *Thesaurus*, that in braille requires 45 volumes. A special system is used to transcribe music.

The project receives no funds from any governmental source. The thousands of hours per book are donated entirely by volunteers except

for the paid work done by the blind proofreaders.

The Education for All Handicapped Children Act, passed in 1975, grants all children the right to a free public education. The federal government will now underwrite only 5% of these costs, but by 1982 will supply 40%. In the meantime, volunteers are needed.

Those interested in contributing to the cause may write to the National Braille Association, 85 Godwin Ave., Midland Park, N.J. 07432, or to the California Transcribers and Educators of the Visually Handicapped. Gifts and Tributes Chairperson for the latter is Margaret Parenty, 1103 Ortega Rd., Pebble Beach, Calif. 93953.

Kincaid is a freelance writer from Ann Arbor, Mich.

SYSTEM 70

The Intelligent Network Terminal that does it all.

You need intelligent source data entry. System 70's got it. System 70 reduces keypunching costs and increases reliability. And, it's got ADDS*PLUS, the special data entry language that makes customizing data entry forms a breeze.

You need communications capability. System 70's got it. System 70 provides remote sites with immediate information access to the central data base. And, it fits simply and easily into almost any new or existing network using any of several communication protocols including: Teletypewriter, IBM 2780, 3780 or 3740 and Burroughs. System 70 makes it all easy.

You need local processing. System 70's got it. Powerful programming languages such as ADDS*BASIC and ADDS*FORTRAN make it easy to accomplish local data processing functions on System 70.

You need a remote print station. System 70's got it. Distant offices generate hard copy using any of several ADDS printers ranging in speed from 30 cps to 340 lines per minute. No network terminal does it all like System 70.

Because you need quality and reliability, you've got it. ADDS reputation for designing and building the finest equipment available is unsurpassed.

Quality, Reliability and Integrity. It all adds up to ADDS.

ADDS

Applied Digital Data Systems Inc.
100 Marcus Blvd., Hauppauge, N.Y. 11787
Telephone: (516) 231-5400

I need more information on the System 70.

Name _____

Firm _____ Title _____

Address _____

City _____ State _____

Zip _____ Phone _____



Drive-in teller uses a terminal from Signature Technology, Inc. of Dallas to verify signature.

Photos by Steve Stibbens

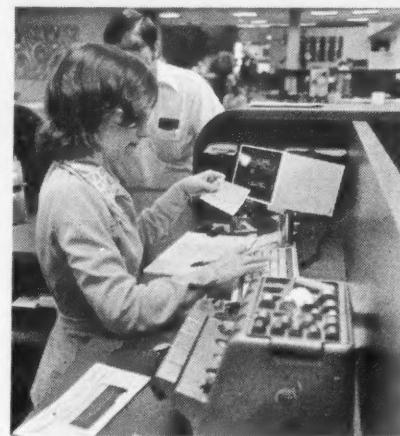
CRTs Help Drive-In Tellers Catch Forgers Red-Handed

LAKWOOD, Colo. — Signature verification terminals in use by tellers at Jefferson Bank & Trust here are reportedly proving their worth in stopping forgers.

In the first four months after 52 Informer, Inc. Model 301 terminals were installed, Jefferson Bank's drive-in tellers caught three forgers red-handed, according to Sam Blackman, vice-president of customer operations.

When the tellers saw that signatures on checks averaging \$600 each failed to match up with the authorized signature displayed on their mini CRT, they questioned the forgers.

Foiled in their attempt, the forgers sped off — but not before tellers copied



Teller in lobby calls up a signature from the bank computer's disk files for display on a 6-in. CRT.

their license numbers.

The tellers kept the bad checks and the bank's money. Police got the forgers.

On-Line System Saves Lawyers Research Time

SAN DIEGO, Calif. — Law students and lawyers here can now save an estimated 70% in research time using Westlaw, a computer system that provides a list of past court cases on almost any subject.

Installed at Western State University College of Law about a year and a half ago, the computer facility communicates via an IBM 3275 CRT on-line to an IBM 370/158 located at the national Westlaw system in St. Paul, Minn.

The system contains summaries of every reported decision since 1967 for all state courts and from as far back as 1961 for all federal courts, according to James O. Werner, law librarian.

Westlaw retrieves information in summary form when an inquiry is keyed into the system and can save as much as a day of examining law reference books, Werner said.

The response to the system has been very enthusiastic, Finz said. People who have a prejudice against computers would change their minds once they tried the system, he said.

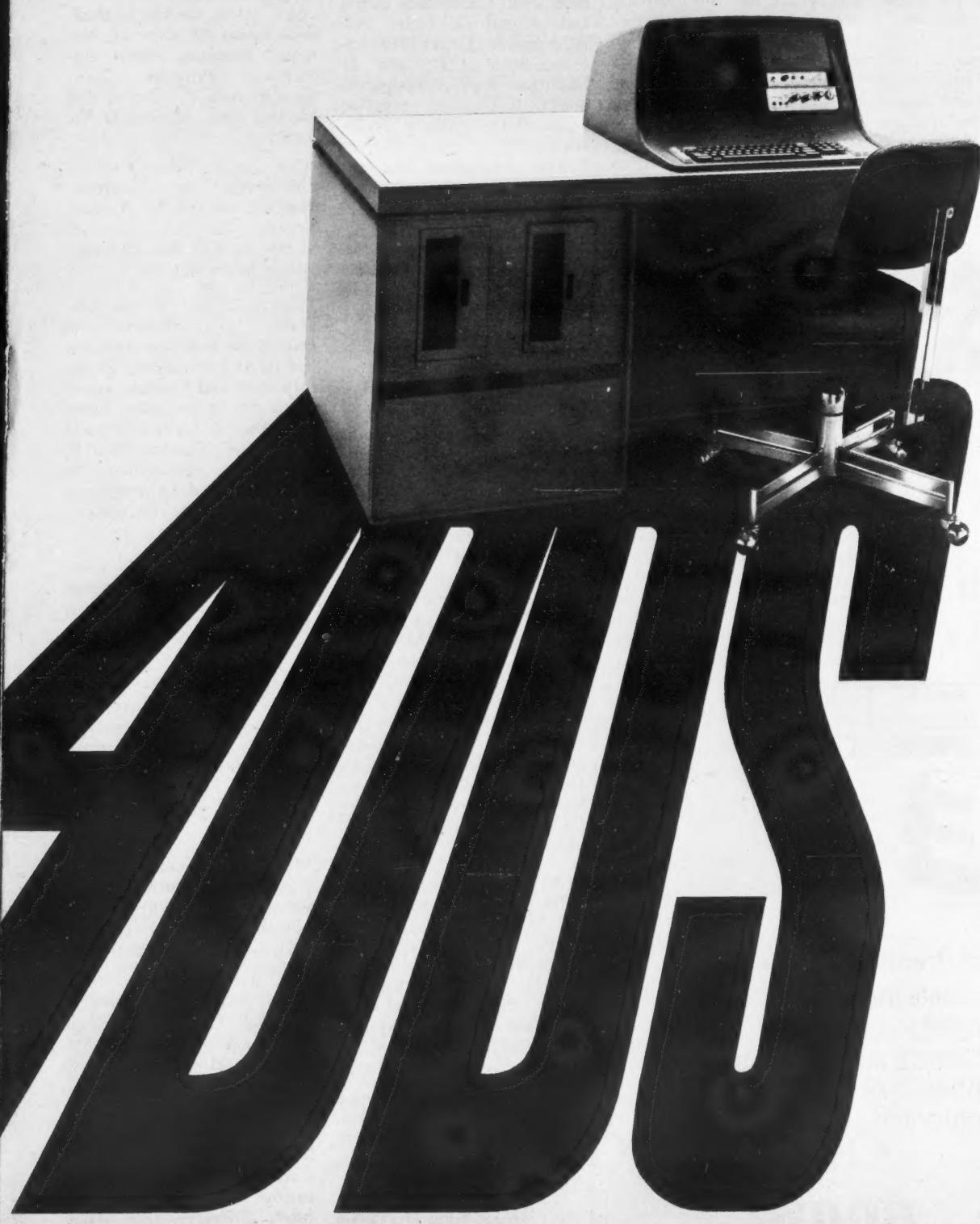
Westlaw is supplied by West Publishing Co. of St. Paul.

Liu, Ghosh to Take NCC Program Posts

MONTVALE, N.J. — Dr. Leonard Y. Liu, manager of the Computer Science Department at IBM's San Jose Research Laboratory, has been named chairman of the 1978 National Computer Conference (NCC) professional program. He will be responsible for the overall planning and implementation of the conference, to be held June 5-8 at Anaheim, Calif.

Dr. Sakti P. Ghosh, research staff member at the laboratory, has been appointed program vice-chairman.

The 1978 NCC is sponsored by the American Federation of Information Processing Societies, Inc. (Afips). Further information can be obtained by writing NCC '78, c/o Afips, 210 Summit Ave., Montvale, N.J. 07645.



V
1
1
3
8

S
E
P

1
9

7
7
UMI

Editing System Expected to Save House \$2 Million in Printing Bills

By Edith Holmes

CW Staff

WASHINGTON, D.C. — The U.S. House of Representatives estimates it will save over \$2 million in printing legislative bills this year as a result of an electronic publishing system installed in April.

Operated by the House of Representatives Information Systems (HRIS) staff as a joint venture with the Committee Reporters' Office, the Committee on House Administration, several House committees and the Government Printing Office (GPO), the system is intended to cut the cost and time involved in con-

verting hearings and committee reports to print.

After three months of limited operation, HRIS determined it had already saved the cost — \$638,200 — of the Atex, Inc. CRT terminal-oriented composition and editing system, a spokesman said.

Using a Digital Equipment Corp. PDP-11 minicomputer to capture, edit and print transcripts, the system has reduced the average time required for printing hearings from more than three months to less than 20 days.

For example, the system made it possible for the House Ad Hoc Committee on Energy to print its June hearings within four working days after they were held, the Committee on House Administration reported.

The GPO can actually produce the original page copy for printing the same day a hearing is held, the spokesman noted.

Used by 19 House committees to prepare more than 250 transcripts and print more than 30 documents, at mid-

summer the Atex system resulted in a direct savings to taxpayers of \$73.62 for each page that was composed electronically. The old hot-metal method of composing text costs \$76.86 per page, while the new approach has averaged only \$3.24 per page so far, including House and GPO personnel, labor and material costs, the GPO found.

The House figured it had to print a total of 8,669 pages before the equipment was paid for and real savings were received. As of July 15, the House had 8,664 pages ready for typesetting, the spokesman said.

The spokesman noted that the system has unexpectedly provided savings in another area as well: it has increased the speed and efficiency of the Committee Reporters' Office. The terminals have enabled more committee reporters to cover more hearings.

The House has not had to spend approximately \$100,000 on commercial reporting services since the system has been in operation as a result of this increased reporter efficiency, the spokesman said.

Oct. 6-7, Washington, D.C. — **Humanized Technology for EDP Management** by Tom Gilb. Also being held Oct. 10-11, Chicago; Oct. 13-14, Toronto; Oct. 20-21, Seattle; Oct. 24-25, San Francisco; Oct. 27-28 Houston. Contact: TSI Sales and Marketing, Inc., 19 W 44th St., New York, N.Y. 10036.

Oct. 6-8, Tokyo — **International Conference on Very Large Data Bases**. Contact: Prof. Stuart E. Madnick, Conference Chairman, Center for Information Systems Research, Alfred P. Sloan, School of Management, Room E53-333, MIT, 50 Memorial Drive, Cambridge, Mass. 02139.

Oct. 9-12, Boston — **Common Fall Conference**. Contact: David G. Lister, Administrative Director, Common, Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.

Oct. 9-15, Atlanta — **Intelcom 77**. Contact: Barbara Coffin, Promotion Manager, Horizon House International, 610 Washington St., Dedham, Mass. 02026.

Oct. 10-15, Chicago — **National Communications Forum — National Electronics Conference**. Contact: National Engineering Consortium, Inc., 1211 W. 22nd St., Oak Brook, Ill. 60521.

Oct. 11-12, New Carrollton, Md. — **11th Annual Instrumentation & Computer Fair**. Contact: Liz Wahl, Program Coordinator, 11501 Huff Court, Kensington, Md. 20795.

Oct. 11-14, New Orleans — **13th Meeting of the Computer Performance Evaluation Users Group**, sponsored by National Bureau of Standards (NBS). Contact: Dennis M. Conti, NBS, A265/Technology Building, Washington, D.C. 20234.

Oct. 17-19, Seattle — **Association for Computing Machinery (ACM) 77 Conference**. Contact: Dr. James S. Ketchel, General Chairman, P.O. Box 16156, Seattle, Wash. 98116.

Oct. 17-19, Los Angeles — **New Tools and Techniques for Manufacturing Management**, sponsored by the American Institute of Industrial Engineers. Contact: Dept. PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Oct. 17-20, New York — **Information Management Exposition & Conference — Info 77**. Contact: Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.

Oct. 18-19, King of Prussia, Pa. — **Second Annual Instrumentation & Computer Fair**. Contact: Liz Wahl, Pro-

Calendar

gram Coordinator, 11501 Huff Court, Kensington, Md. 20795.

Oct. 18-21, Newport Beach, Calif. — **Semiannual National Meeting of the Comtex User Exchange**. Contact: Edwin F. Hart, Applied Physics Laboratory, Johns Hopkins University, Laurel, Md.

Oct. 19-21, New York — **How to Prepare Airtight Computer Contracts**. Contact: Radley Communications Ltd., 509 Madison Ave., New York, N.Y. 10022.

Oct. 19-21, San Francisco — **1977 Fall Conference of the Association of System 2000 Users for Technical Exchange**. Contact: Edward B. Denson, Illinois Central Gulf Railroad, 233 N. Michigan Ave., Chicago, Ill. 60601.

Oct. 23-26, Detroit — **Business Forms 77**. Contact: National Business Forms Association Program Coordinator Julie C. Davis, 433 Monroe Ave., Alexandria, Va. 22301.

Oct. 25-26, New York — **Conference on Electronic Mail**, sponsored by Yankee Group. Contact: Carolyn Matthews, P.O. Box 43, Cambridge, Mass. 02138.

Oct. 25-27, Compeigne, France — **International Federation of Automatic Control (IFAC) Workshop on Information and Systems**, sponsored by Association Francaise Pour la Cybernetique et Technique. Contact: Prof. B. Duboisson, Universite de Technologie de Compeigne, B.P. 233, 60206 Compeigne Cedex, France.

Oct. 25-26, Washington, D.C. — **Advanced Structured Techniques**. Contact: Infosci Inc., Box 7117, Menlo Park, Calif. 94025.

Oct. 25-27, Anaheim, Calif. — **Electro-Optics/Laser '77 Conference & Exposition**. Contact: Technical Program Coordinator, Electro-Optics/Laser '77, 222 W. Adams, Chicago, Ill. 60606.

Oct. 26-28, Minneapolis, Minn. — **Educom Fall 1977 Conference**: "Closing the Gap Between Technology and Application." Contact: Educom, P.O. Box 364, Princeton, N.J. 08540.

Oct. 28-30, New York — **Personal Computing Expo**. Contact: Ralph Ianuzzi, Show Manager, H.A. Bruno & Associates, Inc., 78 E. 56th St., New York, N.Y. 10022.

Oct. 31-Nov. 3, Detroit — **Computer-Aided Design and Computer-Aided Manufacturing Conference and Exhibit**. Contact: Tom Akas, Society of Manufacturing Engineers, Box 930, 20501 Ford Road, Dearborn, Mich.

Mr. BUSINESSMAN

Need help with your COMPUTER?

- equipment selection
- system design/evaluation
- security/privacy/fraud

Call

COMPUTER ASSOCIATES

(213) 475-9928



CALL US



Greyhound Computer Corporation

Available Immediately for Short-Term Lease

370/135-512K with 1421, 3900, 6900, 6981,
6982, 7855, 7861,
3215-1,
3046-1

ONE-TWO OR THREE YEAR LEASE

U.S.

Boston
Chicago
San Francisco

Tom Ryan
Jerry Smith
Dave Hyland

(617) 272-8110
(312) 298-3910
(415) 283-8980

Greyhound Computer Corporation Greyhound Tower Phoenix, Arizona 85077

PRICE

RCA's Family of Cost Predicting Models

One of the PRICE models may be the answer to your needs.

Call us to learn how PRICE can help you predict hardware, software or life cycle costs early in your programs.

PRICE Systems
RCA Cherry Hill Offices, 204-1
Camden, NJ 08101
(609) 779-5212

RCA PRICE Systems

PRICE PRICE PRICE PRICE PRICE PRICE PRICE PRICE

Your investment didn't go down the drain when Gen Com did.

A lot of people think they're out of luck just because Gen Com's out of business.

Not true!

Because Design 100 is here to provide each and every Gen Com customer all the supplies, all the spares, all the accessories, all the enhancements they'll ever need.

After all, Design 100 is the company that built all Gen Com 300Q terminals until last year. And the ones Gen Com built on their own were based on our design.

So what could be more natural than Design 100 taking over Gen Com's customers?

No one's more familiar with the terminals. No one's more familiar with the problems. And no one's more familiar with the solutions.

We've even contracted with Sorbus to service all our terminals. Whether they carry our name or Gen Com's. Or, if you prefer, you can contact our nearest local distributor for service.

Take your choice.

Either way, with Design 100 the only things that go down the drain are your problems.

Emergency Registration Form

Dear Sir:

Help! Gen Com's gone, but my terminals are still here. Here's all the information you'll need to add me to your service and supplies list:

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

I have _____ (number) Gen Com terminals; Serial Numbers as follows _____

Location of terminals _____

Please send me information on CleanPak, a Design 100 service that will save me money on printer terminal supplies.

If you need emergency parts or service, call us toll-free at 800-853-2865.

DESIGN 100™
Because clean is better than dirty.
540 Upper Street, Escondido, CA 92025

V
1
1
3
8

S
E
R

1
9

7
7
UMI

Editorials

Do We Really Need It?

For years we have questioned the worth of the Federal Bureau of Investigation's computer-based National Crime Information Center (NCIC).

Now an independent panel of the Scientists' Institute for Public Information (Sipi) has also questioned the overall efficiency and effectiveness of the computerized system.

The earlier criticisms were mainly about the procedures used by the FBI to ensure that the records contained in the system were both up-to-date and accurate.

Those criticisms are still valid, according to the new report.

But even more disturbing is the fact that Sipi concluded the system may not even be effective for its stated purposes.

For a "vast system, containing over six and one-half million records with 250,000 transactions per day, the 'hit' ratio was not demonstrated to be impressive.

"The actual benefits of NCIC still remain in the area of surmise, rather than demonstrated results," the report said.

In the past, many proponents of the FBI's system have argued that those benefits do outweigh the oc-

casional violations of privacy and human rights that occur.

But now, even those benefits are apparently in doubt.

If the NCIC is as inefficient as charged even the arguments of efficiency are no longer valid — and clearly the system cannot be justified on its privacy record.

The NCIC should be taken out of the hands of the FBI immediately and be constituted as a neutral independent agency such as that proposed by the original Project Search committee in the early '70s.

At the same time, the entire operation should be studied objectively and those parts which are found to be the most inefficient should be dropped out of the system.

As long as the NCIC is part of the FBI, that agency will continue to function more like a national police force than like the federal investigative agency it is supposed to be.

If the NCIC is divorced from the FBI, that agency will be freed to do the job it was established to do — and the overtones of "big brotherism" will be decreased.

And an independent study may find that we need no NCIC at all — finally.

Users Deserve to Know

IBM reportedly has several thousand orders for its 3033 processing unit — a CPU that clearly offers price/performance benefits for users.

At the same time, however, reliable reports both in the press and the user community indicate the firm will only build 800 to 1,000 of the units, which are not scheduled for initial delivery until next year.

Obviously, some users are going to

be disappointed when they find they are not scheduled to get their 3033s for quite a while.

IBM should immediately let users know when they can expect delivery of the new unit, so that users can make appropriate plans — including the 3033 or some alternative mainframe.

By playing it cozy with delivery dates, IBM will only serve to alienate more users than it satisfies.

Data Past

Five Years Ago Sept. 20, 1972

WASHINGTON, D.C.—A draft revision of the 1968 Cobol standard was completed by the American National Standard Institute (Ansi) technical committee X3J4. Users were urged to comment before Ansi's full X3 Computers and Information Processing Committee began its formal consideration of the proposal. Under the plan, there was to be a nucleus and 11 functional processing modules in the complete ANS Cobol, rather than eight.

DES MOINES, Iowa — Des Moines police kept secret computerized intelligence files on "persons of interest" for more than a year, and although some of the suspects were never convicted of any crime, the reports labeled the individuals as "known criminals." The descriptions could be made available, upon request, to law officials throughout Iowa, as well as police, FBI agents and other officials across the country.

Eight Years Ago Sept. 24, 1969

Control Data Corp. separated the pricing of its hardware, software and services. At the same time, CDC announced a price increase averaging about 5% on hardware and maintenance.

General Electric, just before the CDC announcement, said it would not further separate the pricing of hardware, software and services. GE also announced price increases ranging from 3% to 5.1%.

NEW YORK — A microfilm retrieval system that made use of a remote time-sharing computer was demonstrated here.

The system, developed by DSI Systems, Inc., made it unnecessary for the user to have an in-house computer available to retrieve documents from microfilm files. It was also much cheaper than maintaining data on tape or disk either in-house or at a service bureau, according to the company.



Letters to the Editor

Stronger, But Not Faster

I was somewhat amused by the implication in the article on the Voyager II computer problem [CW, Sept. 5] that the installation of the largest disk antenna ever used is resulting in a decrease in radio wave propagation time.

The size of the antenna, of course, will not affect propagation time. The increased distance involved requires that a stronger radio signal be transmitted in order that the signal strength, as received at the Earth, will be sufficient for reliable reception. The larger antenna effectively results in the transmission of a stronger signal.

Robert E. Hubbard
Lakeland, Fla.

as programmers and even cartoonists, in society.

Let us debug your cartoonist.
Reed C. Lawlor
Los Angeles, Calif.

IBM Sales in South Africa

An article in the Aug. 22 issue ["South African Users Tighten Belts"] implies that some IBM sales to Anglo-American Corp. in South Africa are inconsistent with a statement I made at our annual stockholders' meeting. That is not true.

What I said at our annual meeting was that IBM would not bid any business where we believe our products are going to be used to abridge human rights. We are satisfied, from the knowledge available to us, that the application mentioned in no way abridges human rights.

Frank T. Cary
Chairman of the Board
IBM
Armonk, N.Y.

Rigo 'Mandatory Reading'

Congratulations to Joe Rigo on his letter to Ken Lord in the Aug. 29 issue. Joe, I wish I had been the one to say what you said regarding the Certificate in Data Processing (CDP), the Certificate in Computer Programming (CCP), the Code of Ethics and professionalism in general in the data processing industry. This was one of the best reader commentaries I have read in the 12 years that I have been in the business. I have made it mandatory reading for my entire DP staff.

I agree with you that the Carmine Vonas of the world neither want nor need the CDP or CCP titles because they neither help nor hinder those people. Those who do need these titles will never be the Carmine Vonas of the world.

David A. Reser
Long Beach, Calif.

Meet Reveals DP Team Research 'Alive'

By Jack Stone
Special to CW

Would you believe it? Several hundred data processing people plus a handful of sociologists and psychologists working beautifully together!

You and I both know that it was not a large-scale systems development project. The occasion was the annual meeting of the Association for Computing Machinery (ACM) Special Interest Group on Computer Personnel Research (SIGPCR), which spent two days in August grappling with the toughest set of problems facing DP management today — getting DPers to work and communicate together with other DPers — and users — and executives.

And what a job they did! In my opinion, it was the best organized and most meaningful conference of its kind.

I thought it might be useful to offer some general observations I made about the gathering and then discuss just a few of its many, many highlights.

First, I was very impressed to learn that so many projects dealing with DP team development have left the behavioral science laboratories and are now under test in "live" situations.

Second, I was rather overwhelmed with the quality and diversity of the topics covered in the conference. (This is a fancy way of saying that I felt like a rank amateur in this crowd.) But how knowledgeable are you about these ideas that were discussed?

They included structuring the organization "climate," "synergistic" EDP teams, the computer "job environment model," the theory of DP

organization behavior and group effectiveness, the "creeping commitment" phenomenon, team "constituency," the DP "inspection team," "organic-adaptive" DP management, and "pluriprogramming"!

Third, there was a strong undercurrent of humility among the speakers and the audience. Most of the attendees seemed to feel, as did I, that the conference was breaking new ground in this most crucial field and a gigantic job lies ahead, but the effort is underway.

Now for a sprinkling of some of the high points.

Alonzo Grace of A.G. Grace and Co. has studied the application of the concepts and practices of structured programming to management problems in general, and DP systems management problems in particular. He observed that the recent stories of structured programming successes that have appeared in the literature have all involved productivity gains of small groups of people.

He has addressed the question of improving the productivity of the

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

large DP organizations, seeking not the order of magnitude improvements that have been reported but rather a more modest 10% improvement per year sustained over several years. His approach is to view the productivity project as a systems problem to be attacked in an organized way.

However, he was quick to note that, for the large organization, a

productivity project may be far more complex than any DP systems project because many DPers are not inclined to take DP organization strategies seriously enough.

Nancy Anderson and Ben Shneiderman of the University of Maryland talked about the use of peers, rather than managers, for the

people will actually engage in group work activities.

The second relates to the notion of team "constituency" which helps to define the actual composition of the team, taking into account the formal versus informal modes of operation. He made explicit reference to a well-known adage (which we all ignore in practice) when he stated, "Groups whose organizations appear to be the same may possess very different informal organizations which affect dramatically the ways in which they operate."

David Skeen, with the Office of Naval Research, provided a thoughtful analysis of the involvement of users with DP systems development. In his introduction, he neatly identified the three major problems underlying the unending failures of software development projects when he said: "DP did not understand the area of application, the user did not or was not allowed to fully participate in developing the project, and communications between DP, the user, and top-level management deteriorated almost to the point of physical violence."

Finally, a personal note. My reason for attending the conference was to listen quietly (sometimes difficult for me) to the real experts in the field. Imagine my surprise and pleasure when Joan Franz, from the University of California, in her paper on DP group effectiveness, quoted liberally from a recent Computerworld article [Aug. 9, 1976] titled "DP Managers Must Stop Fire Fighting and Start Managing" written by that renowned authority, Jack Stone!

For information on SIGPCR, contact ACM, 1133 Avenue of the Americas, New York, N.Y. 10036.

The Human Connection

evaluation of the "quality" of programs. Their idea is to conduct an annual or semiannual review, administered by a practicing programmer. The review is not for the purposes of determining promotability or salary, but for programmer education, improving cooperation and communication in the team, and self-evaluation. They are supportive of this approach in part based upon the practices of other professions, such as medical, psychological and academic, who typically use peer review boards to evaluate the quality of their work.

Philip Semprevivo, with the computer center of the State University of New York at Albany, presented some novel (to me, anyway) observations about team approaches to systems development. He noted, for example, that there is not, in practice, the team approach. Instead, there appears to be a wide variety of possible approaches.

The existence of this diversity derives from two factors. The first relates to the actual breakout of group vs. individual work, since the fact that a "team" has been organized does not necessarily mean the peo-

Loophole Crops Up on IBM/Australia Front

IBM World Trade's Ralph Pfeiffer narrowed the issues [CW, Sept. 5] but his letter showed up a loophole left by the Australian Parliament when it tried to forbid deceptive and misleading practices effective this July 1.

Apparently there is common ground in regarding any of the practices as wrong. Pfeiffer said the "Unfair Practices" section of the act is in keeping with the IBM guidelines on employees worldwide." But presumably, he would agree that what is wrong for individual employees is also wrong for the corporation itself. If so, we don't have to deal further with the question of right or wrong — merely with appropriate punishment. That simplifies matters.

However, his comment that IBM operations won't be strangled in Australia and that "It should be noted that contracts in force before July 1, 1977 are not affected by the

amended act," does show up a loophole that arises from IBM's contracting techniques. It seems unlikely that the Australian Parliament was permitting any deceptive practices to continue after July 1 when it excluded contracts made before July 1. It seemed to have been seen to it that people would not be punished for actions that were lawful when performed. Thus, any new computer or software that was ordered before July 1 presumably would not come under the Trade Practices Act.

What Pfeiffer's letter draws attention to is that new computers can be announced and sold — even by deceptive and misleading practices which take place since the act went into effect — and yet may be excluded from its provisions! This is because IBM can claim that even newly announced machines are being sold under contracts that were signed before July 1 and which exclude or limit liability.

Under IBM's contracting practices, this is the normal state of affairs and apparently Pfeiffer believes that World Trade can indefinitely continue selling — outside the terms of the act — to the 312 or so current IBM installations.

Pfeiffer claimed he objects to open-ended liability for damages caused by World Trade. Apparently he wants some ceiling but does not suggest a specific one. Last April, IBM announced a new form of contracts which gave a ceiling of \$100,000 or 12 monthly payments (about a quarter of the selling price) of the specific machine in question. Assuming Pfeiffer would propose a ceiling on a similar basis, let us see whether it would prevent

a corporation that markets computers from profiting from deceptive practices in Australia.

The method of obtaining damages in Australia, as in most parts of the free world, is to take the matter to court. This can be expensive, and such expenses are often not under the control of the complaining party. The accused firm also has many rights under the court process and can, by perfectly proper legal

(Continued on Page 16)

What I Said Was . . .

Readers of Ralph A. Pfeiffer Jr.'s letter of Sept. 5 should know that the items he claimed I had stated are inaccurate interpretations of what I really wrote.

Pfeiffer said, "It is not true, as Taylor stated, that IBM is objecting to the 'Unfair Practices' section of the act." On Aug. 1, I wrote, "What is becoming clearer, however, is that what IBM is objecting to is Australia's action to make all firms, large and small, responsible for damages caused by 'deceptive' and 'misleading' conduct." It is

that responsibility to which IBM still objects.

Second, Pfeiffer wrote, "Taylor also stated that IBM Australia's action could 'strangle' IBM customer operations there." In my column of Aug. 1, to show the power of IBM under its current contracts even with regard to non-IBM-owned IBM computers, I had written "Potentially, therefore, it would be possible for an IBM withdrawal to effectively strangle the use of any or all of the 312 installed IBM systems."

The Taylor Report
By Alan Taylor
CDP

V
1
3
8

S
E
P

1
9

7
7
UMI

Eyeing 'Big Brother Land'

All arguments and rationalizations that diminish the exclusivity of a mailing list are merely lubricants that grease the rails to "Big Brother Land."

The supposedly simple protective questions cited by Alan Taylor [CW, Aug. 15] are reduced to absurdities by their very nature. Consider the futility of attempting to define in advance those things that might "harm" or "embarrass" an individual at some future date or of predicting all the "... possible future uses of the information..."

Consider further the uselessness of the individual's being able to "withdraw approval" after some form of damage has already been done.

Obviously, if each compilation of personal data is treated as an ab-

Letters to the Editor

solutely exclusive domain, vast redundancy and inefficiency will exist. However, better than that than the slow erosion of privacy which (future technology permitting) must ensue if various sources of information are exchanged and integrated until, quite logically, the entire society is included in one monolithic data base.

Sheldon J. Baer
Los Angeles, Calif.

Unjustified Assumption

Regarding the "Taylor Report" of Aug. 15, about selling DP lists, I think he has adopted the popular idea of today that all nonprofit organizations are good and all profit-oriented organizations are the bad guys.

I think this idea is too often unjustified. If, for example, the average corporate profit is about 5%, and I believe it is this or less for the latest year compiled, then similar nonprofit organizations should offer services that are at least 5% less cost per unit.

The nonprofit groups incur no property taxes, no sales taxes and no income taxes. In addition, they are entitled to reduced postage rates.

They often receive free labor from volunteers as well as discounts on purchases.

Do their services cost 5% or more less?

Robert Lumbrix
Marshfield, Wis.

STC Not Only Producer

The article entitled "STC 'Super Disk' Sales Enjoy Rapid Growth" [CW, Aug. 1] contained a glaring mistake.

In that article, it was stated "Today, the company has more than 15,000 tape drive installations and, except for IBM, is the only manufacturer in the world producing drives with a recording density of 6,250 bit/in." This is not exactly correct. Telex Corp. has also been producing 6,250 bit/in. tape drives as have both Siemens in Germany and Fujitsu in Japan.

In the OEM marketplace, Pertec Computer Corp. and Telex are also producing 6,250 bit/in. tape drives.

M.A. Lutvak

Memorex Corp.

4-Bit Word Too Short

In reading "Micro Programmers Seen Facing Old Problems" [CW, Aug. 15], I was struck by I. Barron's audacious suggestion of a 4- or 5-bit word.

4 bits allow 16 combinations; 5 allow 32. "English and a few numbers" indeed! Presumably, these would be numbers 1 through 6, and no spaces or punctuation.

Much data processing requires upper/lower case as well as the absolutely basic alphabet, numbers and a dozen or so punctuation marks. The minimal word length to allow this rather standard character set is 7 bits.

Multilingual bibliographic (or any textual) processing really de-

mands diacriticals, bringing the character set up to about 240-250 characters.

I would be delighted to see Barron's proposed 5-bit character set (it might handle Hawaiian). His 4-bit set should be even more instructive for English.

Walter C. Crawford
Walnut Creek, Calif.

For Conservation's Sake

In view of the current emphasis in many areas on conservation, especially in regard to DP and its use of paper, I would like to suggest what I regard as a potential for tremendous savings.

The idea is simple yet far reaching. Have the writers of language translators eliminate the needless page ejects between the EXEC card, source code, end of source code, various tables and maps, diagnostic messages, link

edit, cataloging status report and the end of job indicator.

In a typical compile, you probably have half a dozen pages with four or five lines printed on each one. Not only are these page ejects unnecessary, in some cases they are unwanted. I would prefer to have the phase name on the same page that the source code begins in order to eliminate confusion and possible loss of this valuable information.

I make infrequent reference to literal pool, register assignment, field definitions and displacements, so I could care less if they do not each begin at the top of a page. What is essential is that I be able to find them when I need them, and I could still do this with ease.

Two specific examples from my installation are:

- An 84K, 53-page Ansi Cobol compile could be reduced to 46 pages.
- A 14K, 12-page RPG II compile could be reduced to 7 pages.

The beauty of this suggestion is that there is no trade-off required to achieve these savings.

Jack O'Connor
Conway, S.C.

Loophole Appears in Law

(Continued from Page 15)
stratagems, push the cost of the suit above the \$100,000 mark.

In the case of Australia, as with most World Trade countries, the cost would almost inevitably be above such a figure.

In fact, it would most likely be necessary to send lawyers from Australia to Tarrytown, where Pfeiffer's headquarters are, for instance, to find out what the corporation knew about potentially concealed defects. Even after visiting Tarrytown, the lawyers might well have to cover much more ground to track down IBM's knowledge. As a result, the damages ceiling would soon be reached in costs even before the trial started.

Further Victimization

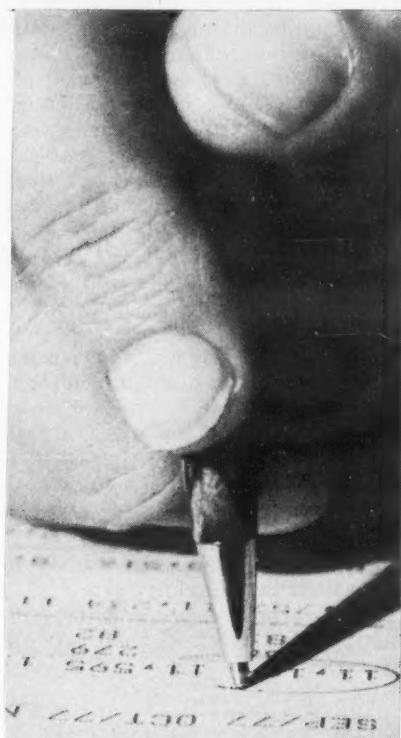
So, a \$100,000 ceiling would simply invite the further victimization of a complaining customer — which is what the Parliament clearly wanted to avoid happening in that country when it outlawed the enforcement of such limitations.

In fact, it seems likely that the victim's costs could reach a \$10 million ceiling. Pfeiffer has given no indication that he would accept a \$10 million ceiling, even though it would not be "open-ended liability."

Nor is the matter restricted to Australia. IBM tells me that when open-ended liability was being considered elsewhere, the firm took similar action. Where and how often I don't know, but it appears to be the general World Trade policy not to trade where it can be held fully responsible for damages it causes.

Hopefully World Trade will divulge its rationale for wanting to deny victims of admittedly wrong behavior their right to fully recover any losses. Such an explanation would fill a large void in the public understanding of the IBM vs. Australian Trade Practices issue.

© Copyright 1977 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.



INFORMATION ...makes it happen

Today, business success demands fast decisions. And fast decisions require decision making information on demand. INFONET delivers it!

INFONET's international remote computing network places full service data processing — full service information — at your fingertips. In data management, financial and business management systems, and the management sciences, INFONET provides the superior decision information tools that give you the "plus" advantage.

Thousands of subscribers around the world have discovered INFONET's "information machine." To learn how it can help you, call or write Box C

INFONET

A Division of

COMPUTER SCIENCES CORPORATION

650 N. Sepulveda Boulevard
El Segundo, California 90245
(213) 678-0311

ECONOMY and POWER

- Display: 24 Lines, 1920 characters
- Addressable Cursor
- Keyboard may be cleared remotely
- Ma Bell Compatible



TERMINAL SYSTEMS INC.

11300 HARTLAND STREET, NORTH HOLLYWOOD, CALIFORNIA 91005

213-769-6772 415-573-7723 Toll Free outside of California 800-423-2449



- 132 print positions
- 30-60 cps
- 10 Key pad
- 5 x 7 Dot Matrix
- Upper and Lower Case

For further information call John Storm

*on quantity orders

Hewlett-Packard Computer Advances

Vol 2 No.3 September 1977



HP 2648 - a bright idea
in graphics terminals

The controllers

The HP 2026 keeps
the data flowing

A bright idea for a graphics display

The world of graphics is expanding to serve more and more people. High-performance graphics, previously found only with more expensive systems, are now available on the new HP 2648 which has microprocessor control and uses raster scan technology.

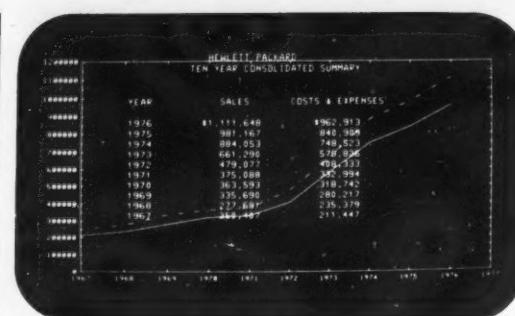
The advantages of refreshed raster scan technology are a continually bright display and selective erase—the ability to make changes without having to redraw the entire image. Raster scan graphics require a bit of memory for each displayable point. Low-cost, high-density semiconductor memory now makes this technology economical.

Ready to plot

The HP 2648 is usable the minute you turn it on. The terminal was designed to be system and software independent, to solve real world problems right away without additional investment in software. All the graphics capabilities are hardware and firmware implemented and executable as simple keystroke functions. Off-line, the HP 2648 can record locally-generated drawing commands on optional tape cartridges, play them back, and support graphics program development. With a CPU complement, the user can interactively create more sophisticated graphics.

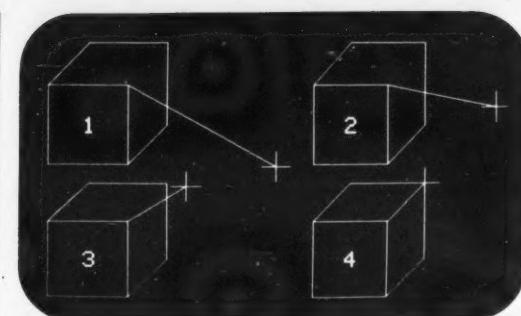
Cover

The design on the screen of the HP 2648 was zoomed to a 10 times magnification. The pattern used emerged from that enlargement.



Auto plot

User-generated tabular data can be automatically plotted with X & Y axes. The data can originate from a computer program, from the mini-cartridge, or from the CRT screen. A simple set of questions, in the form of a "menu," is displayed for the user. After first answering these questions—thus defining the data parameters—the user starts the plotting with a single keystroke. Within seconds, and independent of any system or software, the data is plotted. Sophisticated graphic representation of data is now available to more people in business, education, science, and management.



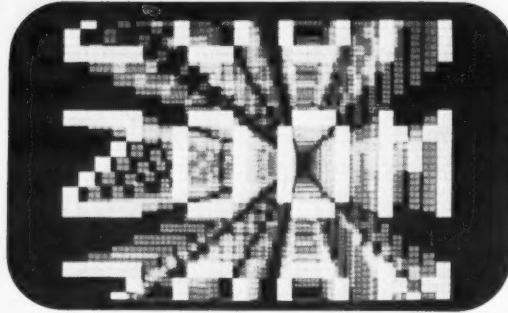
Try it first

There are times when you want to change your drawing without disturbing the data points stored in the CPU's memory. The rubber band line offers a snappy solution to such trial sketches. Line drawings, such as architectural floor plans, can be made and modified quickly. They can even be recorded off-line on the optional mini-cartridge tapes for later batch transmission.

Choices galore

As a user of an HP 2648, you can choose characters of varying shape, size, and orientation, and can right/left justify.

TEXT SIZES N M O D S B
SIZES E D I S P R O D
SIZES D U R A N E
SIZES U P A R D
SIZES S
SIZES S
SIZE

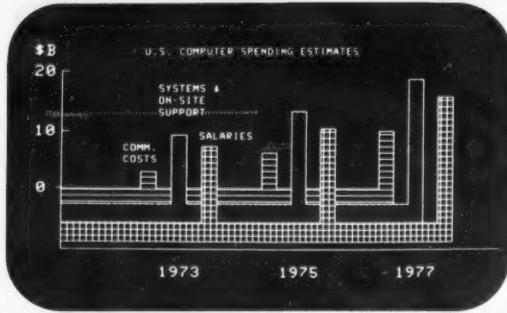


Zoom and pan

Select an area of your display; move right in and magnify it. Zoom one step at a time, or with the touch of a key, zoom automatically to sixteen times the size. Then, pan in any direction through this enlarged display for closer investigation of complex designs. You do not need to re-initialize the data, since the graphics memory has not been disturbed. As zoom and pan are under microprocessor control, they are system and software independent. Without any special software packages or user programming, you can zoom and pan on or off-line.

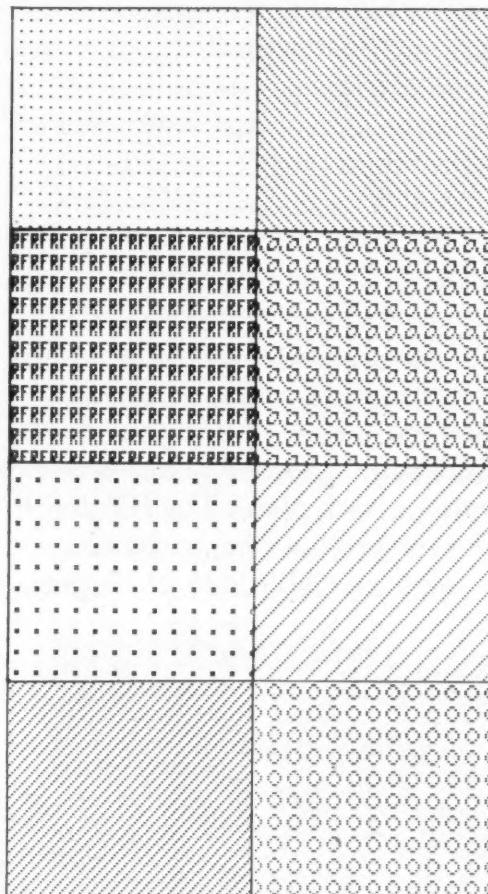
Now you see it, now you don't

The independent alphanumeric and graphics displays each have their own separate random access memory (RAM). So you can view the displays independently or both at the same time. Either memory can be suppressed without disturbing the other. Interact with the CPU/program in one memory and view the resultant picture in the other. This feature makes the HP 2648 perfect both for program development and trial-and-error graphics generation.



Shade your drawings

Rectangular area shading helps distinguish similar shapes. The user can specify different portions of the drawing to be shaded with any of eight available patterns or with his or her own design.



```
10 DIM E$[14],L$[3]
20 REM E$ SET TO "ESC**" (GRAPHICS CONTROL)
30 REM L$ SET TO "ESCA" (DISPLAY CONTROL)
40 E$="2770"
50 E$=2770
60 REM SET CURSOR AND SIZE FOR ZOOM, PERFORM ZOOM
70 PRINT L$+"DA 100 100"
80 REM SET GRAPHICS TEXT SIZE TO 1 AND POSITION PEN TO X=350, Y=179
90 PRINT L$+"PA 350 179"
100 PRINT L$+"DA 350 179"
110 REM CENTER JUSTIFY TEXT AROUND PEN AND WRITE "BASIC"
120 PRINT L$+"BASIC"
130 PRINT L$+"1 BASIC"
140 REM SET CURSOR AND SIZE FOR ZOOM, PERFORM ZOOM
150 PRINT L$+"DA 100 100"
160 REM INCREMENT ZOOM SIZE TO MAXIMUM
170 FOR I=2 TO 16
180 REM SET CURSOR AND SIZE FOR ZOOM, PERFORM ZOOM
190 NEXT I
200 REM TOGGLE ZOOM ---- FLASH TEXT
210 FOR I=1 TO 25
220 REM SET CURSOR AND SIZE FOR ZOOM, PERFORM ZOOM
230 NEXT I
240 REM DECREMENT ZOOM SIZE TO 5
250 REM SET CURSOR AND SIZE FOR ZOOM, PERFORM ZOOM
260 PRINT L$+"DA 100 100"
270 REM SETONE LEFT JUSTIFICATION
280 PRINT L$+"LC"
300 STOP
```

Two terminals in one

The HP 2648 is a dual-capability terminal. Not only can it do sophisticated graphics; it also has those characteristics of HP's 2645 data entry and communications terminal that make programming so easy. These include flexible communications protocols, eight user-programmable keys, full editing, block or character transmission, and off-line data preparation with the dual mini-cartridges. This graphics and alphanumeric combination results in an especially versatile tool.

In the U.S., the HP 2648 costs \$5500; when equipped with cartridge tape drives, the price is \$7100. Quantity discounts are available.

It is difficult to describe on paper what happens on the display of an HP 2648. Check A on the reply card for a live demonstration or for more information.

There's more than one way to weigh a mouse

There's more than one way to weigh a mouse because there's more than one Hewlett-Packard controller that can automate and control processes such as the weighing of medical research animals. Mettler Instrument Corporation of Princeton, N.J., for example, selected HP 9815 desk-top controllers for electronic balance systems that quickly weigh animals that don't want to be weighed. Hazeltine Corporation, of Green Lawn, N.J., on the other hand, plans to weigh fidgety animals using HP 2649 terminal/controllers. One of these products may be the way to solve your controller needs.

Terminal controllers

Hewlett-Packard's 2649 is a versatile, microprocessor-based terminal/controller for which technically-oriented users can design their own firmware or hardware. With the help of a Technical Information Package, custom designing application firmware is a three-step process.

Application programs are first

assembled on any system capable of producing 8080 object code, such as an HP 1000. Object code is transferred from the program development system to mini-cartridges using an HP 13290 development terminal.

The second step is to test and debug the application firmware by loading and executing these mini-cartridges into the RAM of the development terminal.

Then, application firmware object code is transferred to programmable-read-only-memory (PROM) chips for installation in multiple HP 2649 terminal/controllers. For high-volume applications, read-only-memory (ROM) chips are available from specified vendors.

There are two ways a designer can interface the HP 2649 to external devices. With HP's standard interface cards that provide for serial or parallel data transfer, the user need only fabricate a cable to complete the interface. If the application requires a nonstandard interface, users can design and build interface cards that plug into the back plane. The HP 2649 has eleven optional hardware slots available for I/O, display

enhancements, or memory.

Inherent networking capability of the HP 2649 makes it an ideal tool for interfacing specialized devices to various mainframes. Devices controlled by the HP 2649 vary widely. Among them are laboratory scales, cash registers, typesetting equipment, and analog sensors.

Because of the software and hardware development needed to customize an HP 2649, it is most economical when a quantity of systems are needed for dedicated applications. In a business or industrial environment, where untrained people are using the terminal, the customized HP 2649, with its display screen and modifiable keyboard, becomes an especially friendly interface. The HP 2649 costs \$2150*.

Buy a board, build a system

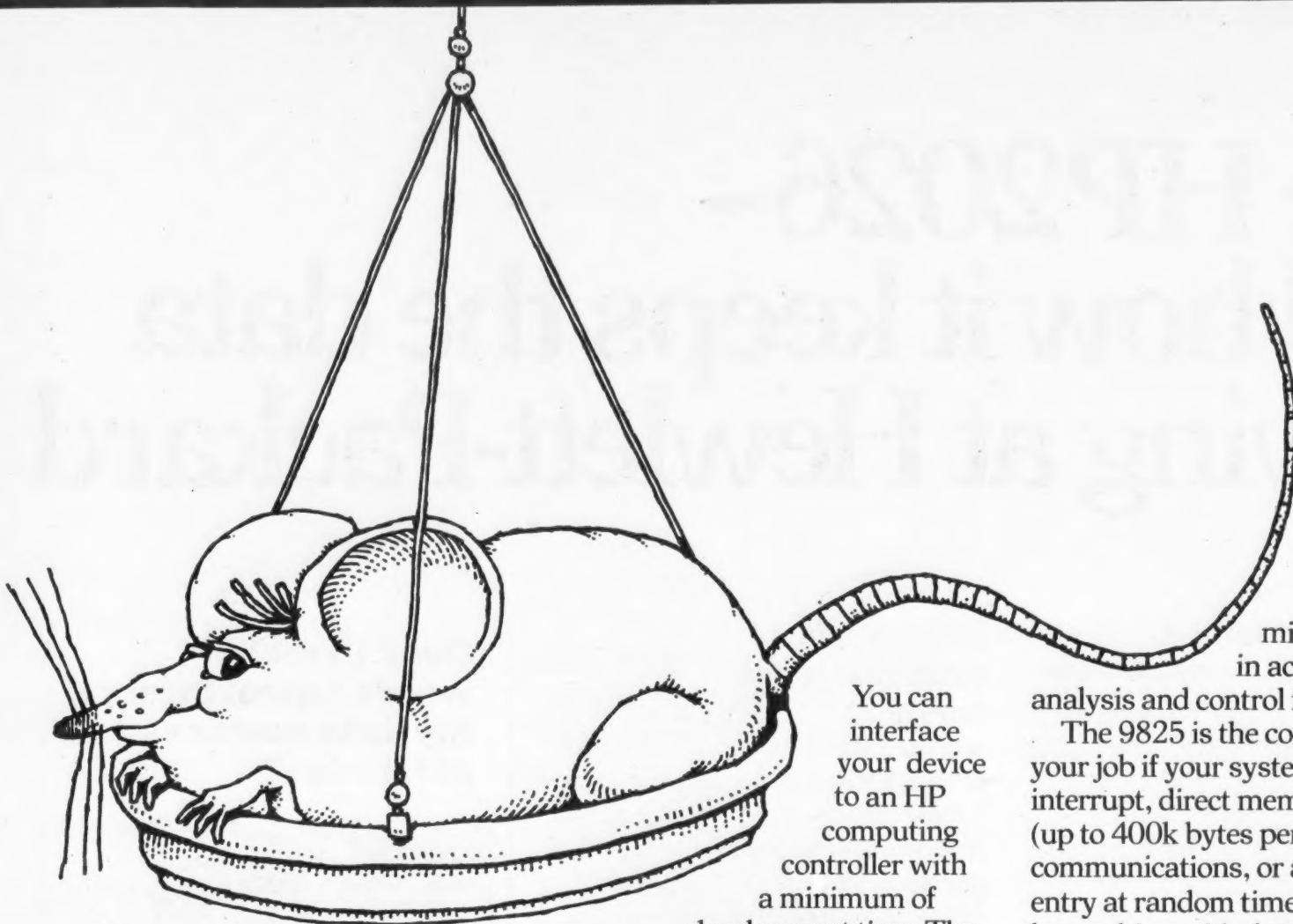
For the OEM designer who needs the power and flexibility of a microprogrammable minicomputer, HP offers the K-series processor, a component version of the 21MX computer family.

Designed to fill the need for high-power processing in a low-cost form that integrates easily into OEM systems, K-Series components offer flexibility in configuring inexpensive products with the full power of a minicomputer. The K-Series can be a full minicomputer that is hardware and software compatible with HP's entire 21MX line. Or, systems engineers can gain direct access to an extraordinarily fast control processor with 325 nano-second cycle time and 210 powerful microinstructions.



HP 2649

HP 21MX-K



Among the many systems applications which can use the speed and power of K-Series components are spectrophotometers, numerical control units, smart data-entry terminals, word processing equipment, graphic display systems, medical diagnostic systems, and many kinds of test equipment. Because the K-Series uses the same I/O scheme as the 21MX family, a wide selection of subsystems is available. These include interface cards for data communications, measurement and control, HP-IB**, and all of HP's broad range of computer peripherals. Prices for the processor board (OEM quantity 100) are \$975*.

Just plug them in and program HP computing controllers, the 9815 and 9825, make system automation easy and direct. Unlike microprocessors and minicomputers, these controllers are integrated in a small, self-contained package that includes printer, tape storage, display, and keyboard. And, you get an operating system and high-level language (pre-programmed in ROM) so you do not need to learn machine language.

You can interface your device to an HP computing controller with a minimum of development time. The physical connection is an off-the-shelf interfacing card with a pre-programmed I/O driver in its read-only memory. You choose from four different interface options—BCD, bit parallel, bit serial (RS-232-C), or HP-IB**. Just insert the card into the controller, and connect the cable to your product. The controller is ready to be programmed for your application using a powerful but simple-to-learn, high-level programming language. HP 9825's HPL provides the ease of BASIC with much of the power of FORTRAN. The HP 9815 uses reverse polish notation, RPN.

Computing controllers manage your instruments, gather data, and process the data to present it in an understandable form. For selected medical and analytical instrumentation applications, and for many measuring systems, HP's computing controllers deliver performance paralleling that of many

minicomputers in acquisition analysis and control functions.

The 9825 is the controller for your job if your system requires interrupt, direct memory access (up to 400k bytes per second), data communications, or automatic data entry at random times; or if you will be working with data bases of more than 100,000 bytes. If these capabilities are not essential, consider the HP 9815. It is the perfect cost effective controller for systems of one or two input or output devices.

The HP 9825 is the first small desk-top computer with interrupt capability. Interrupt gives the controller flexibility to respond to several independent devices that require service at unpredictable times. "Live keyboard" capability enables you to interrupt the 9825's processing to calculate or to interrogate—for example, to monitor a program, or to alter a variable while a program is running.

The HP 9815 is available for \$3100*; the HP 9825 for \$5900*. For more information on HP's controllers, the 2649, 21MX-K, 9815, and 9825 indicate B, C, D, and E respectively on the reply card.

*U.S. domestic prices only.

**HP-IB is Hewlett-Packard's implementation of IEEE Standard 488-1975, "Digital Interface for Programmable Instrumentation."



The HP 2026— and how it keeps the data flowing at Hewlett-Packard

Hewlett-Packard's 2026 data entry and communications system takes a dramatic step beyond traditional data entry. Besides source data entry, it also supports local data storage and retrieval, data communications, and remote job entry—all in a single proven package that costs \$38,500*.

The terminal-intensive HP 2026 system is suited to large companies with geographically-dispersed locations. It satisfies their need to enter, store, and retrieve data locally, yet process it elsewhere.

Source data entry

The powerful Data Entry Application Language (DEAL) makes the development of data entry applications quick and easy. With development of screen formats at a central location, DEAL ensures that the same set of screen formats and edit specifications are used throughout the HP 2026-based network. Source data entry, then, is complete, accurate, and consistent.

Local storage and retrieval

File management capability gives users the ability to quickly scan and retrieve information locally. It eliminates the need to enter repetitive data, and allows sophisticated source data editing.

Point-to-point communications

Any HP 2026 system can act as a central data collection point within the network or transmit information directly to any other HP 2026. Use of innovative software technology results in significant reduction of data communications costs.

Remote job entry

An RJE capability allows any HP 2026 system to communicate directly with large computers, such as HP 3000's or IBM 370's.

The basic HP 2026 system consists of an HP 21MX E-Series processor and disc drive in a desk-style cabinet, and an HP 2645A console terminal. Each HP 2026 can support a total of sixteen additional page-mode multidrop, 9600 baud 2645A CRT terminals. If your applications require more than just data entry and retrieval, and you need sophisticated data management, data processing, or program development using traditional programming languages, Hewlett-Packard offers the multi-purpose HP 3000 computer system.

The HP 2026 was originally developed to meet Hewlett-Packard's needs. Today, after six years of intensive use, it affects virtually everyone at HP...

"Over 10 million words funnel through my data center every single day"



Bill Taylor, HP 2026 manager at HP headquarters, comments: "It's a flexible, all-purpose network that transmits any digital information. Our central system receives data several times a day from other 2026 locations around the world."

"Sixty percent of the data is marketing-related," Bill states, "such as customer orders and acknowledgements. Fifteen percent is accounting data, 10% is employee personnel/payroll data, another 10% is general message traffic, and 5% special files."

"An RJE capability also allows HP 2026 sites to directly communicate with larger host computers. Communication is possible via

*U.S. domestic price (currently available in North America and Europe only)

2780 emulation and multileaving HASP workstation protocols. All data communications and RJE programs can be executed concurrently with data entry."

"With just 20¢ and four hours I can send a message to any HP office in the world"



"It wasn't that way six years ago; our commercial TWX service costs were skyrocketing," reflects Bob Boniface, Hewlett-Packard's executive vice president of administration. "Now, with the 2026 network, 117 systems at any of 94 network sites can communicate with each other. And...the costs are descending, not spiraling upward."

"If I ever again had to enter orders the way we used to, I'd quit"



"I transmit over 3700 sales and service orders monthly," begins Carol Larsen, HP order entry clerk. "As I input an order, the HP 2026's CRT terminal prompts me through all the screens I need. And, it blinks to alert me if I make a mistake. Most errors are corrected at the terminal, so only valid data is transmitted to the system."

"We received the system 1:30 one afternoon," Carol relates, "and, by the time I went home, I felt comfortable using it. I didn't even pick up a user's manual—the terminal taught me with a 'how to' tape cartridge."

"Besides entering new orders, I can store and retrieve order status here, where we need it, to assure quick response to customer

inquiries. If a customer calls me about an order, I simply key in that order name and number, and provide a timely status report over the phone.

"Plus, I don't have to type repetitive data. Our sales office assigns a number to each customer. By entering that number alone, I can retrieve and automatically include customer name, address, phone number, shipping destination, and other pertinent information—all stored on local files."

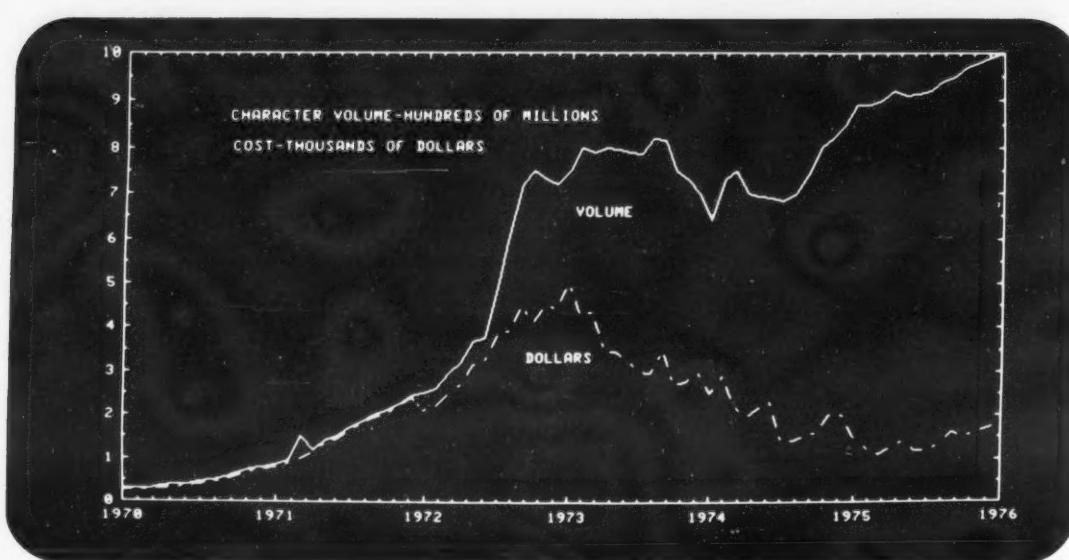
"We paid off all our capital equipment costs in nine months"



"The HP 2026 gave us a significant, easily-measured return-on-investment," says Hank Taylor, HP corporate marketing services manager.

V
1
1
3
8
S
E
P
1
9
7
7
UMI

The HP 2026 (cont.)



In the last four years, the domestic volume of data transmitted by the HP 2026 has more than doubled. But, during that same time, costs have decreased by 60%.

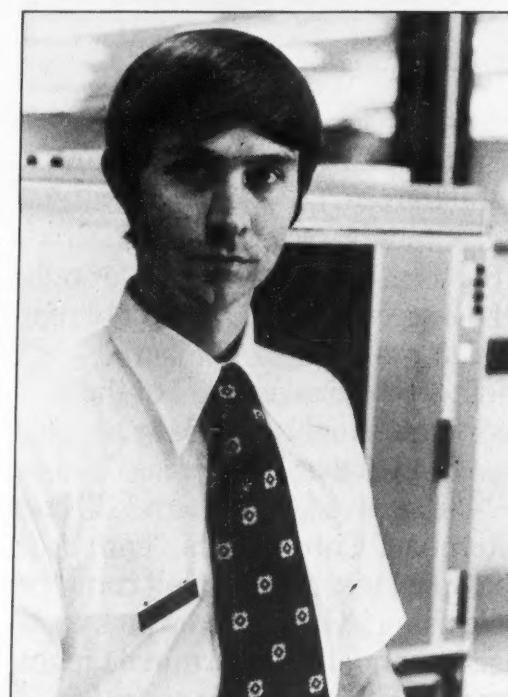
This graph was generated by "auto plot" on the new HP 2648 graphics terminal. (See page 3)

"Comparing data communications costs before and after installing the system revealed that, in less than a year, our line charge savings paid for the system.

"I also recall another significant measure. HP's data entry error rate decreased by 60% using HP 2026 system CRT's rather than former methods. This reduction in errors is also a result of the use of the HP 2026 Data Entry Application Language (DEAL). This powerful software simplifies and shortens the source data entry program development process.

"You see, our central data processing staff develops all data entry screens so that consistent formats and edits can be transmitted to each HP 2026 site. In this way, we maintain central control and ensure that everyone in the network is using the same set of data entry screens. All the development is done by one central data processing staff. Remote sites, of course, still have the capability through DEAL to quickly tailor our screen formats without data processing experts."

"HP'S 2026 is one of the most efficient point-to-point communication systems available"



"We use voice grade common carrier facilities and two HP 2026 data transmission innovations which make the system unusually

efficient," explains Terry Eastham, lab engineer.

"A data compression/expansion technique used between HP 2026's typically compresses our data to 50% of its original volume," continues Terry. "Blanks, numeric strings, alpha strings, and redundant data are compressed and expanded by this feature. In addition, we use a reverse channel line protocol which can yield up to another 40% throughput improvement over normal bisynchronous techniques.

"The combination results in reduced data transmission time and, therefore, significant line cost savings."

For further information on the HP 2026 and HP 3000, check F on your reply card.

HEWLETT  PACKARD

Business Reply Mail
No Postage necessary if mailed in the United States

Postage will be paid by

Hewlett-Packard
1820 Embarcadero Road
Palo Alto, CA 94303

Attn: Computer Advances reply

First Class
Permit No. 141
Cupertino,
California

Business Reply Mail
No Postage necessary if mailed in the United States

Postage will be paid by

Hewlett-Packard
1820 Embarcadero Road
Palo Alto, CA 94303

Attn: Computer Advances reply

First Class
Permit No. 141
Cupertino,
California

Hewlett-Packard Computer Advances/Sept. 1977

Hewlett-Packard Computer Advances

Direct Response Card

HP is pleased to provide you with literature or answer specific questions regarding any computer advances which intrigue you.

- A. 2648A Graphics Terminal
- B. 2649A Development Terminal
- C. 21MX K-Series Components
- D. 9815, 9825 Controllers
- E. 2026 Data Entry and Communications System

Send more information Please contact

Computerworld

Name		
Title	Company	
Address		
City	State or Province	
Zip or Postal Code	Country	Telephone

CW 9/77

Hewlett-Packard Computer Advances

Direct Response Card

HP is pleased to provide you with literature or answer specific questions regarding any computer advances which intrigue you.

- A. 2648A Graphics Terminal
- B. 2649A Development Terminal
- C. 21MX K-Series Components
- D. 9815, 9825 Controllers
- E. 2026 Data Entry and Communications System

Send more information Please contact

Computerworld

Name		
Title	Company	
Address		
City	State or Province	
Zip or Postal Code	Country	Telephone

CW 9/77

A Hearty Endorsement

I heartily endorse the sentiment expressed in the editorial of Aug. 29 entitled "First Things First." The continued development of the information sector is dependent upon public confidence that basic rights, such as the right to privacy, will be protected.

Problems arise when these rights collide with competing values such as freedom of information, criminal justice requirements, welfare reform, economic activity and oversight of government. Experience has shown that privacy protection must accommodate such values whenever possible; otherwise, it is privacy protection which is too often forced to give way.

National information policy should reflect the need for such accommodation by providing a focal point for choosing between competing values. In this way, it would neither threaten nor ignore individual rights but would instead be a major element in their preservation. Computerworld has reminded those who will be shaping that policy of its importance.

Quincy Rodgers

Washington, D.C.

Rodgers is former director of the White House Committee on the Right of Privacy and project director of the "Report to the President on National Information Policy." Ed.

Advice for Mini Users

In the Aug. 29 issue, the report on a survey of over 200 mini users generally showed the minis were rated very highly, but there were some adverse comments on software.

As a user, I have found that if the jobs are small but complex, it is best to train the users to write their own limited software programs. If the jobs are complex with large amounts of number crunching, the best method is to use professional programmers. In either case, it is vital that users understand both software and hardware if they are to get good results.

With minis, the user comes closer to hardware and software, and with micros, hardware and software will often be on users' desks.

Under these circumstances, users of the future will prepare more of their own programs. Professional programmers will have to be more intelligent, sensitive, imaginative and even intuitive to meet the users on common ground. Programmers will have to understand users and the users might even have to understand the programmers.

James G. Ryan

Lexington, Mass.

Three Points to Make

The Aug. 29 issue contained three items of particular interest to me. The first is very important.

Robert Bigelow's letter in reference to Frederick Withington's testimony brings up a critical point. While a court might force a physician to reveal facts, I do not think it could force him to practice medicine, i.e., diagnose or treat a patient. In the same way, I feel the Arthur D. Little position is correct.

Letters to the Editor

Second, Jack Stone's article on automated physicians is about as appropriate as some early thoughts about piloting planes. While coordinating the computer programming of all vendors on the Sage air defense system in the late 50's, I knew there were those who thought we could eliminate pilots. We still use pilots, accountants and part clerks. My organization uses computers to facilitate the work of physicians, but I'm sure the MDs will be around as long as the pilots, bookkeepers and the two men in the petroleum cracking plants.

And finally, Joe Rigo is very sharp after 13 years of experience in the field. When I had 13 years' expe-

rience, Roger Hallock of TAC taught me about whole new areas of pre-entry data organization. A few years back (17 years' experience) I discovered I knew nothing about data bases. Anything, even the Certificate in Data Processing, that broadens a practitioner's comprehension of the field is valuable.

Hugh Cort

Medical Center
University of Alabama
Birmingham, Ala.

Disturbed by 'Controls'

The article "Controls Urged on Technology" [CW, Aug. 15] disturbed me considerably. How a man

(Josef Kates) from a free country can suggest "national controls on technological innovation" reaches far beyond my logical reasoning process. Surely he meant "guidelines" or "prevention of misuse" but not all-out government controls.

In the editorial "A Comforting Thought," in the same issue, an unnamed "Western Cybernetics expert" states "Americans have dealings linked with a computer at least 10 times a day." If that were even close to the truth, Mr. Kates' wishes, if ever realized, could have a profound effect on our lives.

"Technological sovereignty as a prescription for Canada's difficulties" is like a doctor prescribing cyanide to combat a cold. It eliminates the cold but kills the patient.

Wes Williams

Downey, Calif.

Removing the rose-colored glasses.

A realistic look at *Data Base Management Systems* in the October 31st Computerworld.

In the ten years since Data Base Management Systems were introduced they've grown to a multimillion dollar subindustry in their own right. As late as 1973, less than 1,000 DBMS were installed; but International Data Corp. estimates that over 5,000 are in use today, and this number will increase to 8,200 in the next two years. This phenomenal growth has been fueled by the hoped-for benefits of DBMS, which include increased programmer efficiency, the elimination of redundant information in the data file, and greater ease in coping with system upgrades and reprogramming.

But a data base management system should be evaluated carefully before you commit to purchase. They have developed such a reputation as problem solvers that people tend to expect more from them than they can achieve, while overlooking or minimizing the effort required.

We'll have several experts on hand to help you arrive at a realistic understanding of DBMS in our October 31st special report edited by Don Leavitt. Here is a sampling of the kinds of articles you'll see:

- Combatting the "Holy Grail" syndrome — Being realistic about the benefits that are possible in relation to the effort required; how to assess whether DBMS will enable you to reach your goals.
- How well are installed systems living up to expectations? A review of typical problems that need to be overcome.
- The role of the Data Base Administrator in DBMS — including considerations like the physical arrangement of the data base.
- How dictionary packages, report writers, etc. interface with DBMS software.
- A review of selection criteria and the implementation process.
- How DBMS ties in with distributed data processing — matching intelligent front ends with intelligent back ends, for example.

As this short preview shows, our special report on Data Base Management Systems in the October 31st issue will interest people who are considering DBMS, as well as people who already have one installed. And if you market Data Base Management software, remember that your ad will reach more of your primary audience here. Ad closing date is October 14. Your Computerworld salesman has all the details. Or call Terry Williams at (617) 965-5800 to reserve space for your ad.



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Boston

Bob Ziegel
Mike Burman
(617) 965-5800

New York

Don Fagan
Frank Gallo
(201) 461-2575

San Francisco

Bill Healey
Jim Richardson
(415) 495-0990

Los Angeles

Bill Healey
Jim Richardson
(213) 475-8486

1
1
8
S
E
P
1
9
7
7
UMI

INTRODUCING The COPS family of low-priced micro-based CRT's



COPS 15
\$950.00*

COPS 20
\$995.00*

COPS 30
\$1225.00*

What makes them different is what they have in common.

What makes these units so practical, efficient and economical is the unique board design common to all three. Which means that even the lowest priced model has the same standard features as the top of the line unit. The difference in their functional capability is in the keyboards available with the COPS 20 and COPS 30. So, if you buy the COPS 15 and later want to upgrade the functions, you can add the COPS 20 or 30 without changing the software.

Write or call us at (203) 333-8339 and let us tell you how we can give you so much for so little.

Standard Features

- Characters per line — 80
- Lines per display — 24
- Screen Capacity — 1920 Characters
- Character Format — 7 x 9 dot matrix (10 x 12 field)
- Character Set — 128 ASCII
- CRT Screen — 12 inch diagonal, P 4 phosphor with etched face plate
- Display — White on Black or Black on White
- Cursor — Block or Blinking Underline
- Reverse Video (Character and Screen)
- Memory Type — 2084 x 8 Random Access Memory
- Auto Repeat
- Upper and Lower Case
- Bell
- Printer Port with on/off key
- 63, 80 and 104 Key Keyboards
- Cursor Keys up, down, left, right, home, CR, LF and Tab

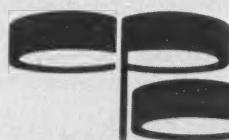
Functional Capability

- Cursor address (absolute)
- Incremental cursor control
- Read cursor address

- Clear screen
- Clear to End of line/field
- Clear to End of screen
- Home Cursor
- Set hi/lo intensity
- Audible alarm
- Backspace
- Keyboard Lock
- Keyboard Unlock
- Insert line, Insert Character
- Delete line, Delete Character
- Tab/Back Tab
- Reverse Video By Character
- Inverse Video
- Cursor Commands, up, down, left, right, CR, LF, Home and Tab
- Transmission Send Screen
 Send Line
 Send Message
- Protect Modes For Format

Communication Interface

- Full or Half Duplex/Buffered Transmission
- EIA RS 232C and Current Loop 20 ma.
- Switch Selectable Baud Rates — 110, 300, 600, 1200, 1800, 2400, 4800, 9600, 19,200



Computer Peripheral
CORP.

*Quantities of 101-500

1225 CONNECTICUT AVENUE • BRIDGEPORT, CT 06607 / (203) 333-8339

Poorly Developed Theory

The Aug. 22 column by Jack Stone, "Where Are the Operations Success Stories," contained a thesis I found poorly developed and unsubstantiated. Stone may have a wide circle of contacts but his implied conclusion that there are few successful operations is presumptuous and naive.

We all come to conclusions about our own experience and environment from time to time, but we cannot validly extend our conclusions universally without some kind of analysis, survey or substantiation.

I know of successful operations and of some rather less than successful. Condemning them all in a column of a widely read publication is old hat, passe, unrealistic and no longer interesting. I thought our profession was growing out of that tired approach.

Perhaps Stone was "baiting" readers. A simple request published in the column would have been more appropriate and perhaps more fruitful.

Jean A. Fowler
Raritan, N.J.

Umpires in the DP Game

In the Aug. 22nd issue, Jack Stone, in his search for a successful data processing manager (DPM), brought to light a tragedy caused by organizational hierarchy.

This company hierarchy includes everyone from the president to the lowest clerk. DPMs are somewhere in the middle, with roles similar to those of umpires in a baseball game. They must call the pitches (reports) but they have no control over the game (management).

Under these circumstances, DPMs must consider themselves successful when they do their job well, and then accept the boos as all good umpires do. It's a tough job!

Happy DPMs are those who are lucky enough to be either aware of or involved in the total operation of an enterprise. It was no coincidence that his one successful case was actually involved in a scientific problem.

James G. Ryan
Lexington, Mass.

Root of Antitrust Delays

I have just recently read the article in the May 9 issue entitled, "U.S. vs. IBM Shows Shambles of Antitrust Law, Senate Told." That article characterized my May 4 testimony before the Senate Subcommittee on Antitrust and Monopoly to the effect that "He, too, put the responsibility for defining the direction of these suits at the doors of the judges who hear them."

The title of your article, the above quote and your use of my statement to the subcommittee that I have "no defense" for the longevity of the IBM case make it appear that I singled out one government case for criticism, above other major government antitrust cases.

The article does not reflect my remarks in context, nor my views. I certainly did not criticize the competence or performance of any judge; my point was aimed at a larger, generic issue.

The thrust of my testimony con-

Letters to the Editor

cerned the government's failure to properly investigate and then to manageably define the issues prior to bringing massive antitrust cases. This lack of issue definition by the government, in cases of major economic (and social) consequence, places severe burdens on the judicial system when it attempts, under the liberal federal discovery rules, to manage pretrial discovery. This, in my view, is a principal cause of complexity and delay in "big" antitrust cases.

The problems of administering complex antitrust cases are generic and require across-the-board evaluation and solutions. Simplistic solutions suggested by others — such as an "elitist" group of roving

antitrust judges — read better than they will play, and they miss the mark.

The essential problem is to find the means to quickly define the issues in these major cases and, without depriving the parties of due process, make discovery and trial manageable.

Ira M. Millstein

New York, N.Y.

CRTs Can Be 'Congested'

I was interested in the article "Caution: CRTs May Be Eye Hazard" [CW, July 18]. I must disagree with Jeryl Sparks, who stated that the dot matrix print is "horrible." I have never seen any re-

search that indicates a dot pattern is more difficult to read than individual lines forming the same character.

It seems to me the main reason for CRT terminal eyestrain is too much information on the screen. Operators must move their eyes continuously, putting strain on the eye muscles. Publications such as Computerworld recognize this problem and make their columns narrow. As a result, the eye can scan an entire line without having to move in a horizontal direction with resultant muscle strain.

I believe the problem is not having to focus on dots (although close work will cause eye strain), but simply that the eye has to move to read an 80-column wide line.

Byron Cole
President
Informer, Inc.
Los Angeles, Calif.

Ampex memory for PDP-11/70. Spend less, get more.

Add Ampex memory to your PDP-11/70. You'll get better performance than you would with DEC's own memory, and you'll only spend around half as much money.

Money isn't the only thing you'll save with Ampex memory. You'll save time, too. Using four-way interleaving, effective cycle time of an ARM-1170 memory is 350 nanoseconds. Even without interleaving, Ampex memory

cycles within 725 nanoseconds.

Ampex ARM-1170 memory comes in increments of 128K bytes and can expand a PDP-11/70 computer all the way to 4 megabytes.

DEC has a great product in the PDP-11/70. And now you can make yours work even better, and save some money at the same time. Order your PDP-11/70 memory from Ampex and get it now.

AMPEX

Ampex Memory Products Division
200 N. Nash Street • El Segundo, California 90245
(213) 640-0150

The only connection between Digital Equipment Corporation and Ampex Corporation is the one you make yourself when you plug our memories into their computers.

Our new “walkaway” leasing program is better than anything IBM has to offer.

Our new INVESTMENT
TRUST LEASING
PROGRAM offers short
term “walkaway”
operating leases on new
IBM System 370 computer
systems and all other
current IBM equipment.
And at prices that offer
tremendous savings over
IBM lease and rental rates.

DPF, a Fortune 500
company, is one of the
largest independent
computer leasing
companies in the country
with a computer portfolio
of over \$450 million at
original cost.



If you have an IBM
system presently on order
or need early delivery, we
would like to save you a
lot of money. Just call Mike
Swords, collect, at DPF
Inc., Executive Offices,
141 Central Park Avenue
South, Hartsdale, NY
10530, (914) 428-5000. Or
call any of our regional
offices listed below.

Mid-Western Region
Chicago - 850 East Higgins Rd., Suite 127
Schaumburg, IL 60195
ATTN: Bruce Thompson
(312) 843-1800

Southeastern Region
1925 Century Blvd., Suite 4
Atlanta, GA 30345
ATTN: Wayne Curry
(404) 633-6329

Western Region
170 State St., Suite 232A
Los Altos, CA 94022
ATTN: Bill McDermott
(415) 941-4354

Eastern Region
141 Central Park Avenue South
Hartsdale, NY 10530
ATTN: Clement DeSimone
(914) 428-5000

I/O System Included 'TMS' Builds, Updates, Accesses Tables

By Don Leavitt
CW Staff

MILL VALLEY, Calif. — The Table Management System (TMS) from Jeffrey L. Walker & Co. was designed as a standardized, efficient means of storing and retrieving table information in an IBM 360/370 environment, according to a spokesman.

A table, in this context, is a

group of arguments and results. An argument — essentially a record key — is known at table access time while the result — desired record data — is returned to the user by a successful table lookup operation, the spokesman explained.

TMS supports the creation and maintenance of tables used in systems and programs without

requiring program changes, recompiles or relinks, he said. Using the software, tables can be created for one others.

Internally, the tables are retained on a random file and do not require reorganization even after changes of contents. A standard backup and restore capability is provided as part of the TMS package, the spokes-

man noted.

Each table can contain any number of entries; access to the table file from a user's application program is handled through the use of the package's search subroutine. It interfaces with the Input/Output System (Iosys) a file organization method used by TMS to perform all table I/O processing [CW, April 11].

Two user-oriented programs are part of the package. Tabsys is a batch program for table file maintenance; Tabl does equivalent work, on-line.

A series of available, separate-cost features can extend the basic package to include data compression and data protection support and interfaces to either the IBM CICS or the GBA International Swift teleprocessing monitors.

The basic package, described as device- and operating system-independent, requires 48K for the file maintenance subsystem.

The package costs \$5,000 or \$500/mo for a year; the options are typically an additional \$1,000 each, the company noted from 655 Redwood Highway, Mill Valley, Calif. 94941.

For DG's RDOS Users

'Wordmap' Prints Cross-References

PALO ALTO, Calif. — A debugging and documentation tool, Wordmap from Information Processing Techniques Corp. (IPTC) was described by the vendor as a general-purpose, symbolic cross-reference generator for Data General Corp. minicomputers.

Given text files for input, Wordmap produces a listing of the files with line numbers and then generates an alphabetically sorted table of all symbols in the files, a spokesman said.

Along with each symbol in the table is a list of line numbers indicating where every reference to the symbol can be found, he said.

The package accepts "any form" of text including Fortran, Algol or Assembly language programs and English or other narrative documentation. Input files can be of any size and contain symbols of arbitrary length.

Wordmap suppresses any number of user-specified symbols such as Assembler op codes or compiler keywords, he said, and this results in a cross-reference

table tailored to the user's requirements. The suppression facility allows Wordmap to be used for file comparison and spelling corrections, he added.

Global in Nature

The cross-reference listing produced by the package is global in nature: it can encompass a complete source file containing many subprograms, the spokesman said. Facilities provided with many compilers are limited to cross-referencing each program separately, he noted.

Output from this package in-

cludes page headers giving the date, time, file number and page number; output can be written to any file or device. No internal sorting methods are used, so Wordmap is not limited by memory, the vendor said.

The package functions on a minimum DG Nova needed for RDOS operations, as well as on larger Novas and Eclipses using that environment.

Wordmap is available on magnetic tape in RDOS-executable form for \$950, IPTC said from 2462 Embarcadero Way, Palo Alto, Calif. 94303.

Directory Lists T/S Services

PHILADELPHIA — The looseleaf "Remotely Accessible Conversational Programs and Data Bases" directory contains descriptions of individual facilities offered by time-sharing vendors.

The \$28 annual subscription includes bimonthly updates, according to the publisher, Gregory Research Associates, 1900 Greymount St., Philadelphia, Pa. 19116.

'Ramis' Gains Interface With IMS

PRINCETON, N.J. — An interface that provides users of the Ramis II and Ramis DOS information processing systems with fully automatic access to data bases under IBM's IMS and DL/1 has been announced by the Ramis vendor, Mathematica Products Group, Inc.

With the linkage, the Ramis nonprocedural language is used to issue the request while the standard Ramis report capability formats and displays the report, the vendor said.

Once the IMS data base is described to the system's internal dictionary, Ramis appears to process an IMS data base as though it were any other file.

The interface is efficient, Mathematica explained, because the appropriate sequence of DL/1 calls is issued by Ramis to retrieve the proper IMS segments; Ramis screening condi-

tions, mapped into DL/1 logic, are used to provide qualified segment search arguments.

Batch Program

The interface operates as a batch program — in IMS terminology. It may be activated under IBM's TSO, effectively providing time-sharing access to off-line IMS data bases through the Ramis language, the spokeswoman continued.

The Ramis-IMS interface operates through a special module within the Reporting from External Files (REF) Ramis option. The module is currently available for \$4,000 or \$140/mo for 36 months.

The REF option can be purchased for \$5,500. The basic Ramis II software needed to utilize the IMS interface costs \$34,000 while the Ramis DOS packaging starts at \$20,000.

Mathematica Products Group is at 14 Washington Road and can be reached through P.O. Box 2392, Princeton, N.J. 08540.

Siemens CPUs Get 'Easytrieve'

OAKBROOK, Ill. — Easytrieve, the information retrieval and data management system from Pansophic Systems, Inc., has been made compatible with Siemens 4000 series CPUs running under BS1000 or BS2000 environments.

The system was previously available only for IBM 360/370 hardware, a spokesman noted.

The Siemens hardware population is centered in Germany and Scandinavia; pilot versions of the Easytrieve package have been installed in both areas, Pansophic said from 709 Enterprise Drive, Oakbrook, Ill. 60521.

You Name it!

JOB ACCOUNTING & BILLING SYSTEM FOR OS, DOS/VS, POWER/VS, DOS

Jasper Does it!



FEATURES:

- Report Generator for Flexibility
- Graphic Analysis of Performance

- CPU Capacity Measurement
- User Billing & Cost Distribution

Yes! Rush full information about Jasper & the 30 day Free Trial DATACHRON 174 FIFTH AVE. NEW YORK N.Y. 10010 For faster action call collect (212) 675-5333

NAME _____

CO. _____

ADDRESS _____

STATE _____

ZIP _____

TITLE _____

TEL. _____

CITY _____

COMPUTER MODEL _____

SYSTEM _____

1
9
7
7
UMI

'CPS' Gives Mathematical Program Support

HOUSTON — Management scientists, operations researchers and others with mathematical programming requirements may get the help they need, regardless of what large-scale CPU they have, with the Key Conversational Planning System (CPS) now available from Lowell-Welter Associates (LWA).

The package incorporates an array of capabilities for interactive or batch operations, including linear program-

ming, nonlinear programming and dynamic programming, an LWA spokesman said. Key CPS runs on Fortran-compatible CPUs, he added.

Users are said to have complete control of logic and solution strategy in both modes of operation. Only two control commands — which can be entered from terminal or console — are needed to make any of 125 million combinations of conditional changes to, for example, a 75x150 representa-

tion, the spokesman claimed.

The user may also enter data, examine selected portions of the results, change the data, change the solution strategy and continue the run under new conditions until either additional modifications are indicated or the desired results are achieved, he said.

In a single job stream, several cases may be run as variations of the original base case and results from previous cases can be used to specify a new case and then modify it.

Key CPS is designed to efficiently process 150x300 representations interactively in 78K bytes of memory, the spokesman claimed.

The package costs \$11,500 or \$400/mo for a minimum of six

months. Two days of on-site training and consulting, ordered concurrently with the licensing, costs \$1,000 plus travel expenses.

Lowell-Welter Associates can be reached through P.O. Box 1597, Houston, Texas 77001.

Energy Systems Listed

SPRINGFIELD, Va. — The \$20 "Directory of Software Applications: Energy 1977" contains abstracts of 300 energy-related programs and reports in various computer languages. It is available under catalog #PB-264 200, in paperback or microfiche, from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

PDP-11 Linked to 360/370

IRVINE, Calif. — The Distributed Processor Communications Module (DPCM) from Computer Solutions is used to move data between a Digital Equipment Corp. PDP-11/03 processing station and any other devices that meet binary synchronous communications protocol, including IBM 360/370s.

The addition of DPCM allows a stand-alone PDP-11 to be extended to access the resources of a large-scale CPU to which it has been attached, while retaining features developed for its local operations, a spokesman explained.

The DPCM user need not know teleprocessing "internals" to work with the package. Application programs communicate with DPCM through READ and WRITE calls, much as any peripheral is addressed.

The parameters in the calls are validated by DPCM, which alerts the user if an error is sensed. This early warning system "significantly" reduces check-out time during program development, the spokesman asserted.

The package features data transmission rates up to 9,600 bit/sec and transparency is provided for binary data. Both the Ascii and Ebcidic character sets are supported, including error-checking routines and retransmission for bad blocks.

A trace table may be optionally loaded which aids in the identification of teleprocessing problems. DPCM is time-independent of the user. All timing is controlled internally, according to the spokesman.

DPCM requires a PDP-11/03 with 4K words of memory, a DEC DUV11 parallel synchronous interface and a modem. The software, distributed as a

Impact of ZBB To Be Discussed

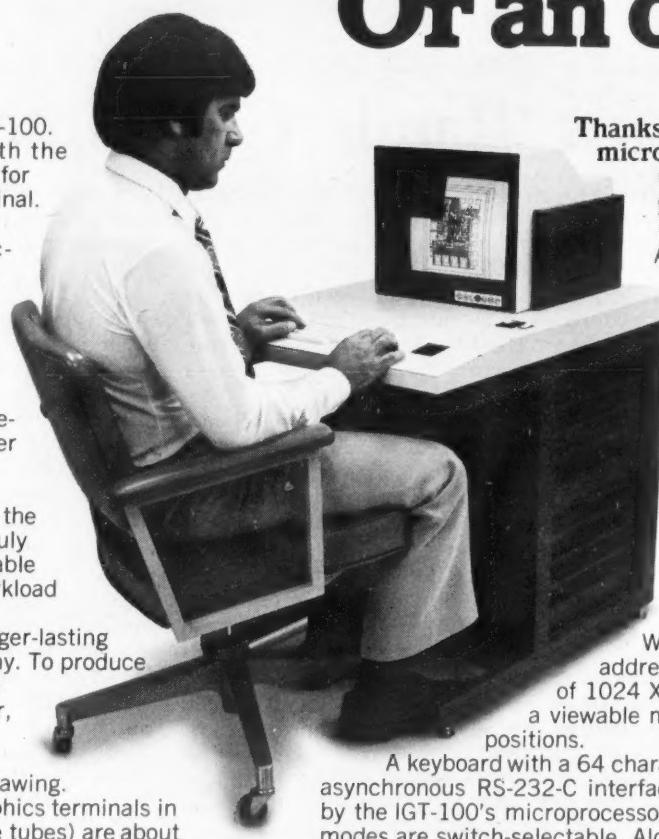
WASHINGTON, D.C. — "Zero-Base Budgeting in the Federal Government: A Performance Audit of the First Six Months" will be the topic of a meeting here in late October, sponsored by the Federal ADP Users Group Special Interest Group on Zero-Base Budgeting and Automated Data Processing (SIG/ZBB/ADP).

Logan Cheek, author of *Zero-Base Budgeting Comes of Age*, will be the principal speaker at the session, on Thursday morning, Oct. 20, at the General Services Administration Region 3 Auditorium.

More information is available from Ken Burroughs, Chairman of SIG/ZBB/ADP, c/o U.S. Chamber of Commerce, 1615 H St. N.W., Washington, D.C. 20062.

Fortran-callable routine, costs \$2,000, Computer Solutions said from Suite L, 17922 Sky Park Circle, Irvine, Calif. 92714.

Finally. A full-power terminal that doesn't tax a host or an operator.



We call it the CalComp IGT-100.

It's an acronym with the emphasis on action. Short for Interactive Graphics Terminal. A unique, new CalComp graphics tool that effectively combines built-in intelligence with advanced refresh technology.

The first in a new family of Interactive Graphic products from CalComp. All specifically designed to make things easier for both the host computer and the terminal operator.

For starters, we made the IGT-100 interactive. And truly intelligent. So it's fully capable of sharing the graphics workload with its host computer.

Then, we gave it a longer-lasting raster scan (TV) type display. To produce faster, brighter, flicker-free images. To give you sharper, black-and-white graphics. And to totally eliminate time-consuming image redrawing.

By contrast, most graphics terminals in the field today (with storage tubes) are about as far from interactive and intelligent as you can get.

Dependent is more like it. Because, typically, every graphic image — and every graphic manipulation — has to be carefully calculated, then transmitted, by the host computer to the waiting graphics terminal.

This whole routine not only puts a tremendous burden on the host computer (which usually has other jobs to do) but routinely requires lots of special software.

With storage tube type terminals, even routine manipulations like panning, zooming, selective erasing and message changing aren't very fast. In fact, the terminal operator is required to wait — up to several minutes — for a previous image to be completely erased and the second image to be tediously redrawn.

You get the picture, all right. But you'll get it faster with the new CalComp IGT-100. Because the IGT-100 is the quickest solution to these traditional problems. And easily, one of the most affordable.

Thanks to our built-in microprocessor, efficiency doesn't get lost in the shuffle.

A built-in microprocessor helps make the new IGT-100 one of the smartest graphics terminals you can buy. And one of the most efficient.

Coupled with 12K bytes of RAM memory, the IGT-100's microprocessor permits local storage, manipulation and completion of display functions.

While providing an addressable memory matrix of 1024 X 680 bit positions. And a viewable matrix of 416 X 312 positions.

A keyboard with a 64 character ASCII set and an asynchronous RS-232-C interface are also supported by the IGT-100's microprocessor. Full or half duplex modes are switch-selectable. Along with asynchronous communication transmission rates from 300 to 9600 baud.

Give your new IGT-100 the whole picture and you'll never redraw it again.

Unlike most other graphics terminals, the new IGT-100 can store and manipulate images on a totally local level.

That means once an image is transmitted, you've got complete, autonomous control. All planning, selective erasing and message changing is instantaneously handled by the IGT-100's built-in microprocessor.

Even write-thru's, grids and zooms (2x, 4x, 6x and 8x) are displayed on the screen within 1/10th of a second.

And all without tying up your host computer. Or waiting several minutes for the image to be redrawn on a storage tube.

In fact, working with its built-in microprocessor, the IGT-100's longer-lasting raster scan screen will beat a conventional storage tube every time. Delivering a faster, brighter image at a flicker-free rate of 60 frames per second.

And that's a mighty pretty picture — any way you look at it.

\$ \$

INTERACTIVE EXPENSE CONTROL SYSTEM

The system that lets you control your expenses by providing you with up to the minute information. It is available on any computer that supports ANSI-COBOL. The system completely interfaces with any general ledger, accounts payable, accounts receivable, payroll or purchasing system including our own interactive ones. Also available as a complete turnkey system including hardware.

- Cash Control
- Travel Advances
- Expense Distribution
- Employee Reimbursement
- Vendor Reconciliation
- Relocation Expenses
- CRT Data Entry
- On Line Inquiry
- Distributed Processing
- Written in Cobol
- Your Computer or Ours
- Guaranteed Installation

INTERACTIVE COMPUTER SYSTEMS

27 Andover Street, Danvers, MA. 01923

(617) 774-8668

BUSINESS SYSTEMS SPECIALISTS

ACCOUNTING

PURCHASING

MARKETING

Please send me information about your interactive:	
<input type="checkbox"/> General Ledger <input type="checkbox"/> Accounts Payable <input type="checkbox"/> Accounts Receivable <input type="checkbox"/> Payroll <input type="checkbox"/> Order Entry <input type="checkbox"/> Inventory Control	
<input type="checkbox"/> Please send me more information on your interactive expense control system. I am interested in a: <input type="checkbox"/> Complete turnkey system <input type="checkbox"/> Comprehensive version for our computer. We have a computer.	
Name _____	Title _____
Company _____	Phone () _____
Address _____	
City _____	State _____ Zip _____

RETAIL

INSURANCE

DISTRIBUTING

Join the more than 1000 DP Managers now using the Johnson Job Accounting Report System.



SUPPORTS:
MVS—SVS—VS1—DOS/VS—POWER/VS—MVT—MFT—CICS/VS—IMS/VS—HASP
 Tell us what areas you're interested in!
 Job Accounting Budget Control Resource Utilization
 Cost Distribution Thruput Programmer Efficiency
 Software Performance Customer Billing Job Scheduling

Send for your FREE 30 page System Characteristics Manual

Name _____
 Title _____
 Company _____
 Address _____
 State _____ Zip _____ Phone () _____
 Computer _____ Operating System _____



8400 Westpark Drive
 McLean, Virginia 22101
 (703) 893-8700

C919

Users Able to 'Own' Data In Distributed Data Bases

By Stephen L. Robinson

Special to CW

Every few months, it seems, there is a new technique, a new buzzword, guaranteed to revolutionize data processing. In the last few years we've heard about data base, intelligent terminals, bubble memories, microprocessors, EFTS and packet switching — to name but a few.

In part, the development and popularization of new techniques is a sign of the dynamic nature of our industry. The way we grasp for these new techniques is a sign of dissatisfaction with the status quo.

Consider data base systems. The concept has been developing for several years and data base packages sales are accelerating. However, all is not well in the world of data base.

Inherent in the development of a true data base system is a change in the philosophy of data management (see "Data Base Corner," CW, May 2). This change has not been very popular in many organizations.

Functional areas have lost "ownership" of their data. The concept of distributed data base systems, which would tend to restore some data ownership to functional areas, is therefore greeted with huzzahs that do not reflect all the technical and management problems associated with distributed data.

What Is It?

Let us first distinguish between distributed data processing and distributed data base; and then distinguish between types of distributed data base systems. (Note: the combination of distributed data base and distributed data processing is also clearly possible.)

Put very simply, a distributed data processing system consists of:

- A number of nodes (locations which may contain one or more input devices, computer configurations or output devices).
- The capability to enter a "job" at one node and have the "system" decide where to run the job (alternatively, the user may specify a particular node for the job).

Usually, a job submitted to a distributed DP environment carries with it a description of where its input data is to be found.

In a distributed data base system, a job is typically run at its own "home node," but the requisite input data is distributed at other nodes.

Data Base System Types

We should distinguish between two types of distributed data base systems. In a *static distributed system*, a prospective user must "know" which node has the data that is required. That is, a call for data must specify a node.

In a *dynamic distributed system*, a prospective user need not specify where the requisite data is to be found. Indeed, users will not know where the data is stored. The "system" will maintain a data dictionary of data element names, and aliases, and will generate data requests to the appropriate nodes.

propriate nodes.

Although I know of several operational static systems, I am not aware of any full-blown dynamic systems. The potential flexibility and adaptability of a dynamic system augurs well for the next five to seven years.

In the interim, static systems offer some interesting advantages over centralized data base systems. In particular, functional areas may once more "own" their data and they may organize their data to optimize their applications.

Following are some disadvantages of distributed data:

- Backup, recovery and restart are tougher problems.
- Synchronization of redundant data can be quite complex.
- Security/privacy issues are complicated.
- Performance of internode applications may degrade to the extent that functional areas may retreat into file system isolationism.
- The unknown always holds surprises.

There are, of course, many additional arguments — both for and against distributed data base systems. I would welcome reader descriptions of operational distributed data base systems — and especially reports on benefits and problems.

Robinson is an independent consultant, having recently organized S.L. Robinson & Associates, 517 N. Pennsylvania Ave., Morrisville, Pa. 19067.

'Plotall' Aids Graphics Work

AKRON, Ohio — The Plotall language developed by the University of Akron enables non-DP-trained people to use an IBM 360/370 to create a variety of graphics without getting involved at a programming level.

Plotall can be used to create line graphs, pie and bar charts, histograms and other "art work" that adds impact and understanding to verbal or written reports. The system supports four types of calendar and logarithmic axes, shading for pie and bar charts and up to six lines of title and text information, a spokesman noted.

Output Variable

The plotting software is basically designed to produce 8-1/2-in. by 11-in. output, but this can be adjusted — to larger or smaller dimensions — through control card entries prior to execution, he said.

Plotall is written in a combination of IBM's Assembler language and Fortran, for use with 360/370 systems equipped with Calcomp plotters. Access to all Calcomp plot routines is through individual subroutines provided to the user so that various graphics devices can be used.

License agreements to use Plotall, which functions under both OS/360 and OS/VS environments, cost \$500 for educational institutions and \$1,000 for industrial users.

More information is available from the Plotall Coordinator, University of Akron Computer Center, Akron, Ohio 44325.

COMPUTERWORLD



...the one weekly newspaper that's designed to fulfill your unique "need to know" . . . the one newspaper that can give you all the current information you need to benefit you, your organization and your career progress . . . 52 weeks of incisive news, commentary and special reports . . . subscribe today, use the attached postage paid order form.

Please enter my subscription
(details on back)

I'm already a subscriber,
but I'd like you to
change my:

- address
- title
- industry
- other

My current mailing label is attached
and I've filled in new information
on the other side.

Put old label or label information here

Please send me **COMPUTERWORLD** for one year. RATES: United States—\$18 Canada and PUAS—\$28
Europe and Middle East—\$50 All Other Foreign—\$65

Check Enclosed

Charge My American Express Account.

If charge we must have cardholder's signature:

Signature: _____

Expiration Date: _____

First Initial	Middle Initial	Surname					
Your Title							
Company Name							
Mail To:							
City			State	Zip Code			

Address shown is:

- Business
 Home

Check here if you do not
wish to receive
promotional mail from
Computerworld.

Check here if you're
interested in receiving
information on
Computerworld's Index.

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY

- 10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other: _____

TITLE/OCCUPATION/FUNCTION

- 11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/
Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other: _____



COMPUTERWORLD

CIRCULATION DEPT. 797 Washington Street, Newton, Mass. 02160

Detach here, fold, and place in post-paid envelope attached through binding.

OUR YEAR-END TERMINAL SALE!



LA-36 DECwriter II

\$1,375

...DDI's single unit price



DIABLO HY-TERM 1620-1

\$2,595

...DDI's single unit price

(Also, 1620-3 for \$2,795)



TI 745 Portable Data Terminal

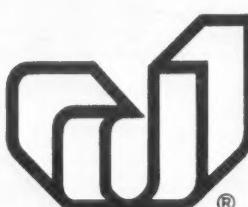
\$1,695

...DDI's single unit price

Offer ends Dec. 15, 1977...call DDI, America's leading Terminal supplier, now!

Favorable pricing is just one factor in the value equation which assures you your best buy comes from DDI. Whatever your need in data communications equipment, DDI has the quality products you want—ready for delivery. And with DDI, you also get:

- A single source for DEC, TI, ADDS, DIABLO, OMNITEC, TECHTRAN.
- Full range of new products.
- Choice of rent/lease/buy plans.
- Unique Combination Savings Plan.
- Nationwide maintenance service.
- Nationwide branch network for prompt response to your needs.



Data
Dimensions,
Inc.

51 Weaver St., Greenwich, Ct. 06830 TEL. (203) 661-1700

Branch offices: New York City • Morris Plains, N.J. • Philadelphia (Cherry Hill, N.J.) • Washington, D.C. • Detroit (Southfield) •
Chicago • Atlanta • Dallas • Houston • Los Angeles (Encino) • San Francisco

8th National Conference on Human Resource Systems

You are cordially invited to attend the...

Information Science Incorporated 8th National Conference on Human Resource Systems

Place:

Hyatt Regency O'Hare
Chicago, Illinois

Time:

Monday, October 31,
Tuesday, November 1,
Wednesday, November 2

It's the key event of the year. Leaders in every area bring you up-to-date on latest developments and trends. Including EEO—ERISA—OSHA—The Privacy Issue—and the revolutionary new Human Resource Dedicated Computer.

If you are professionally interested in human resource systems management, you should seriously consider attending the 8th National Conference on Human Resource Systems.

The "main event" speakers include such distinguished individuals as: Edward Brooke, U.S. Senator, Massachusetts who will speak on "Jobs—Who Should Provide Them and How"; Abraham Ribicoff, U.S. Senator, Connecticut, who will speak on "Privacy as it Relates to Employment"; and Weldon Rougeau, Director, Office of Federal Contract Compliance Programs, who will speak on "What to Expect From the Office of Federal Contract Compliance Programs as it Enforces the Law."

A special feature of the Conference this year will be a major study on **Human Resources Programs: Costs and Results**—prepared at the University of Minnesota.

In addition, there will be important follow-up Case Studies on other pivotal HRS problems—as encountered and solved by leading organizations. These Studies were also prepared at major universities.

Choice of 39 Workshops

You will have a choice of 39 exclusive Workshops to attend at the Conference. These stimulating one-hour sessions give you an in-depth briefing on the human resource subjects of greatest interest to you. Nowhere else in the country will you find so many top human resource leaders chairing such vitally useful discussions.

A unique attraction at this year's event will be the first public demonstration of the Human Resource Dedicated Computer. Dramatic proof that the mini-computer has come fully of age in the industry.

There will be several informal get-togethers in the course of the Conference. These provide excellent opportunities for spontaneous exchanges of views—and garnering of information.

An excellent investment

Personal introductions can be easily arranged with any of the principal speakers, Workshop leaders and colleagues from other organizations with whom you may wish to confer.

Because of the tremendous and constantly growing stakes involved in human resource management, attending the Conference can be an excellent investment.

To make reservations for yourself and your colleagues—just fill out and mail the attached Reservation Reply Coupon. Or, if you prefer, call: Sheila Alper at 201-391-1600.

We are looking forward to the pleasure of having you with us at the Conference.

Bring Your "Team" To The Conference

It can pay rich dividends to have several colleagues and associates from your organization attend the Conference.

- It enables your group to cover all Workshop sessions of special interest to you.
- It helps promote a "unified professional point of view"—a consistent, high standard on human resource matters within your organization.

Want more information about the Conference?

If you have questions—or want additional information about the Conference—call Sheila Alper at: 201-391-1600.

Reservation Reply Coupon

Mail Today—or phone: 201-391-1600—for reservations

Mail to:
Sheila Alper
Information Science Incorporated
95 Chestnut Ridge Road
Montvale, New Jersey 07645

Important:
Mail as promptly as possible. Attendance is limited to extent of physical facilities available.

Gentlemen:

Please make the following number of reservations for me and my organization
(write no. of reservations)

I understand that, promptly upon receiving this Reservation Reply Certificate, you will forward to me the necessary information on hotel reservations—which I can then handle directly with the hotel.

This confirms my phone reservation.
 Check enclosed Bill me. Bill my company.

Checks should be made payable to: Information Science Incorporated, 95 Chestnut Ridge Road, Montvale, N.J. 07645.

Registrations (including myself)

Full Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Full Name _____

Title _____

Full Name _____

Title _____

Full Name _____

Title _____

Registration must be made in advance, and may be made up to the time of the Conference. Early registration, especially this year, is strongly recommended.

The fee includes the cost of all luncheons, meeting materials and receptions. First participant—\$425. Second participant from same organization—\$400. Third or additional participant from same organization—\$375 each.

Cancellations and Refunds. Confirmed reservations may be cancelled up to October 14. Participants who have not cancelled reservations on or before October 14 are subject to the entire fee. Substitutions may be made at any time.



8th National Conference on Human Resource Systems

Program

InSci
Information Science Incorporated

Sunday, October 30

7:00-11:30 p.m.—Registration

7:30-9:30 p.m.

Early Bird Welcome Party
Wine, Cheese, and Music

Monday, October 31

7:30-9:00 a.m.—Registration

9:00-9:30 a.m.

InSci in Transition

Dale H. Learn, President, Information
Science Incorporated



9:30-10:30 a.m.

Jobs—Who Should Provide Them
And How

Edward Brooke, U.S. Senator,
Massachusetts



10:45-11:45 a.m.

Critical Role Of Personnel Management
In Today's Corporate Environment

Russell N. Freund, Vice President,
Personnel, Philip Morris, Incorporated

12:30-2:30 p.m.

Lunch

From Space To Human Resources

Edgar D. Mitchell, President, EMCO;
Apollo 14 Astronaut



2:30-5:00 p.m.

Concurrent Workshop Sessions

Legal Implications of Recent EEO Suits
For The Corporate Community

Session Leader: Thomas Phalen, Esquire,
Phalen

Using The Computer For Manpower
Planning And Forecasting

Session Leader: Bob Flast, Manager,
Human Resource Analysis, International
Paper Company

Basics of Computerized Personnel
Information

HRS In The Health Care Environment

Development Focused Performance Appraisal

Session Leader: Neil Thompson, Vice
President, Blessing, White

Basics Of The General Retrieval System

The Politics Of Human Resource Sys- tem Implementation

Session Leader: Alan Bell, Senior Associate,
Applied Management Sciences,
Warner-Lambert

System Upgrading Considerations In A Large Diversified Company

Session Leader: David Bowers, Program-
ming Manager, AMF, Incorporated

Minicomputers And The Personnel Function

OnLine HRS And Banking
Session Leaders: Martin Benjamin, Sys-
tem Analyst, National Bank Of North
America, David Witalis, EDP Officer, First
National State Bank of New Jersey

The Data Analyzer

Session Leader: Sherman Drusin, Vice
President, Program Products, Incorporated

The Think Tank Approach And The Human Resource System

Session Leader: Pat Coyne, Manager,
Employee Relations and Personnel Sys-
tems, Amstar

5:30-7:30 p.m.

Reception

Cocktails, Music, Hors d'oeuvres

Tuesday, November 1

9:00-10:00 a.m.

Privacy As It Relates To Employment

Abraham Ribicoff, U.S. Senator,
Connecticut



10:15-12:30 p.m.

Concurrent Workshop And Case Study Sessions

Establishing An HRS In Canada

Session Leader: Mike Villani, HRS Coor-
dinator, Steinbergs Limited

HRS/Payroll Entry via Remote Terminals

Session Leaders: Walter W. Tullis, Director,
Personnel Information System, Fire-
man's Fund Insurance Company, Joseph
Marzo, Senior Systems Analyst-Personnel,
Fireman's Fund Insurance Company

New On-Line Capability With Your Batch HRS

Session Leader: Michael J. Parrella,
President, Decision Strategy Corporation

Implementing A Payroll System

Session Leader: Lee Elliott, Manager
Corporate Systems, Allendale Insurance
Company

Skills Profiling And Career Manage- ment

Benefits: Employee Orientation Techniques

Session Leaders: Dorothy Needham, HRIC
Manager, Foley's, Lorah Gough, HRS
Project Manager, Foley's

Using The Computer For EEO Compli- ance And Affirmative Action Planning

Motivation And Organizational Behavior

Session Leader: Samuel B. Marks, Direc-
tor of Government Services, American
Management Association

Case Studies

Health/Safety Administration And The Computer

Harvard Graduate School of Business Administration

The Corporate HRS And Privacy

Harvard Graduate School of Business Administration

12:30-2:30 p.m.

Lunch

Human Resources Programs: Costs and Results

William Pyle, Ph.D, Director, Human
Resource Research Programs, University
of Minnesota

2:30-5:00 p.m.

Concurrent Workshop And Case Study Sessions

The Handicapped: Personnel Policies And Practices

Session Leader: Harold E. Krents, Esq.,
Surrey, Karasik & Morse

Computerizing Benefit/ERISA Information

Session Leader: Connie Combs, Assistant
Vice President, Manager of Personnel
Information Management, Valley National
Bank

Successfully Managing The Human Resource Information Center

Session Leader: John Westenkirchner,
Personnel Systems Administrator, Owens
Corning Fiberglas Corporation

The Integrated Personnel/Payroll System

Session Leaders: C. Nolan Richardson,
Director of Data Processing, Jerry
Browning, Manager Systems and Pro-
cedures, Sonoco Products

Graphic Reporting For Personnel Management

Session Leader: Paul Kalbach, Vice Presi-
dent, Program Products, Incorporated

Implementing A Minicomputer-Based Personnel Information System

Session Leaders: Jim Fleming, Manager
Personnel Information System, Philip
Morris, Incorporated, Errol Johnson, HRS
Coordinator, Philip Morris, Incorporated

Development Of A Personnel Automa- tion Plan In The Banking Industry

Session Leader: Gregory MacNeil, Assis-
tant Vice President, Chemical Bank

Human Resource And Cost Accounting

Session Leader: William Pyle, Ph.D, Director, Human
Resource Research Programs, University
of Minnesota

Case Studies

Health Safety Administration And The Computer

Harvard Graduate School of Business Administration

The Corporate HRS And Privacy

Harvard Graduate School of Business Administration

Wednesday, November 2

9:00-10:00 a.m.

What To Expect From The OFCCP As It Enforces The Law

Session Leader: Weldon Rougeau, Director, Office
of Federal Contract Compliance Programs



10:15-11:15 a.m.

The Role Of Computer Technology In Airforce Human Resources Manage- ment

Brigadier General H. L. Emanuel, Deputy
Assistant DCS/Personnel For Military
Personnel

12:00-2:00 p.m.

Lunch

The Human Dimension Of Affirmative Action

Harold E. Krents, Esq., Surrey, Karasik
& Morse



2:00-4:30 p.m.

Concurrent Workshop Sessions

Minicomputers: Pros And Cons

Use Of IMS In Personnel/Payroll Systems

Session Leader: Douglas J. Cotts, Direc-
tor, Data Base Assistant Team, Automated
Concepts, Inc.

New Uses For The Human Resource System

Session Leader: Kirk Honold, Corporate
Manager, Personnel Systems, Baxter
Travenol Laboratories

Medical/Health/Safety

Session Leaders: Curtis D. Bowden, Manager
Safety and Health, Florida Steel,
Phil Dandridge, Manager, Personnel
Administrative Services, Springs Mills

Further Uses Of The General Retrieval System

Controlling Manpower Costs In Banking —Forecasting, Analysis And Imple- mentation

Session Leader: Judy Nelson-Moore,
Assistant Personnel Officer, First National
Bank of Denver

Benefit Statements

Session Leader: Cathy Lowenbraun,
Insurance Manager, Kane-Miller Corpora-
tion

Management Interaction With HRS

Session Leader: Jesse Romer, Personnel
Officer-HRS, United Virginia Bankshares,
Inc.

Security Considerations Of A Personnel System

The Personnel System In A Highly Decentralized Industry

Session Leader: John Gandolfo, Manager,
Personnel Systems, ARA Services, Inc.

Implementing Point Of Sale Input Mechanism For Hours/Earning

Session Leader: Mal Hightower, Manager,
Systems/Programming, U.S. Specialty
Retailing



1
1
3
8
S
E
P
1
9
7
7
UMI



We have a new software systems catalog for VM/370 users and we'd like to send it to you.

BUT IBM WON'T TELL US WHERE YOU ARE!

You'll learn about the famed Computer Associates software products and systems that will far outperform any comparable ones you're using now. They'll save you time and money!

- **SYMBUG:** A completely integrated debugging system for the interactive debugging of COBOL, Fortran and Assembler programs.
- **IDOS/VIS:** An interactive DOS/VIS programming facility for VM/370 systems that allows DOS and CMS environments to exist concurrently in the same virtual machine.
- **VSORT:** Implementation of OS sort compatibility for CMS. Functions as a stand-alone utility, as support for COBOL Sort verb or callable from PL/I or Assembler routines.
- **ISAM:** CMS simulation of OS ISAM. It also provides a CMS ISAM utility command to create, dump and reorganize an ISAM file.

COMPUTER ASSOCIATES IS ONE OF THE WORLD'S MOST DISTINGUISHED SOFTWARE RESEARCH AND DEVELOPMENT ORGANIZATIONS.

We serve you through offices throughout the United States and world-wide.

MAIL COUPON NOW FOR FREE VM/370 SOFTWARE SYSTEMS CATALOG!

Computer Associates CW 9/19
655 Madison Avenue, New York, N.Y. 10021

YES! Rush my FREE VM/370 software systems catalog. No obligation, of course.

Name
Title
Company
Address
City State Zip
Telephone Number (Area code, please)
Computer Model
System

U.S. OFFICES: New York, Georgia, Illinois, Michigan, California, Texas, Connecticut, District of Columbia.
WORLDWIDE OFFICES: Australia, Austria, Belgium, Denmark, France, Italy, Japan, United Kingdom, Germany, Holland.

School Days

Software Key To Sessions In New York

NEW YORK — "Software: Project Management, Tools and Techniques, New Developments" is the title of a two-and-a-half day conference to be presented by the American Institute of Industrial Engineers (AIIE) at the Hotel Roosevelt here, Oct. 17-19.

The meeting will include plenary sessions, the first day; workshops examining the impact of evolving technology, the second day; and a panel discussion analyzing software quality and conflicting trends. Registration fees is \$265 for AIIE members and \$295 for others, with "team" discounts available. The seminar is being run by Management Education Corp., P.O. Box 3727, Santa Monica, Calif. 90403.

Career Concerns Covered in D.C.

WASHINGTON, D.C. — "How to Succeed in the World of EDP," a seminar described as the premiere presentation of the special interest group on career counseling of the Association of Computer Programmers and Analysts (Acpa), will be held this coming Saturday, Sept. 24, at the Quality Inn Central, Arlington, Va.

Topics ranging from individual career development and purpose of the resume to interview techniques will be considered during the working sessions. Jack Stone, author of *Computerworld's Human Connection* column, will speak at lunch.

Registration fees now are \$40 for Acpa members and \$55 for others, with a \$30 fee for students, the association said. Registrar is Linda Miller, 7708 Hanover Parkway T-3, Greenbelt, Md. 20770.

System Sessions Set in 2 Cities

ROCKVILLE, Md. — Effective Data Systems Development will be the subject of a three-day seminar by Barnett Data Systems in Houston and in Washington later this year.

The \$425 course will be in Houston on Oct. 25-27; in Washington on Nov. 7-9 and again on Dec. 5-7. A one-day briefing keyed to the "problem definition" portion of systems work will be presented in each city, for \$155/person, the day after the longer seminar.

Barnett Data Systems is at 19 Orchard Way North, Rockville, Md. 20854.

Topic: Tuning

DELRAN, N.J. — Datapro Research Corp. has scheduled a seminar on "Computer Performance Measurement: Tools and Techniques for Increased System Productivity" in four cities this autumn.

The seminar will be in Washington, D.C., Oct. 24-26; in San Francisco, Oct. 31-Nov. 2; in New York, Dec. 7-9; and in Chicago, Dec. 14-16. Cost is \$425 for current Datapro subscribers and \$475 for others, the company said from 1805 Underwood Blvd., Delran, N.J. 08075.

Management To Be Theme

NEW YORK — Each registrant attending the "Management Skills for the Systems Professional" seminar in late October will be assigned to work with a small group of other managers who have similar backgrounds and expertise, according to the American Management Association.

By working out solutions to simulated problems and presenting their findings to the entire class, participants should learn ways to organize the systems department, to interview potential employees, to train the systems team, to allocate personnel and set priorities, a spokeswoman said.

Running from Oct. 31 through Nov. 4, the course costs \$610 for AMA members and \$700 for others. The association is at 135 W. 50th St., New York, N.Y. 10020.

HP and College To Teach APL

FULLERTON, Calif. — Four independent but related seminars will be offered here late this month and in October by Orange Coast College and Hewlett-Packard Co.

The seminar schedule includes "A Manager's Hands-On Guide to APL on a Mini," Sept. 20; "Hidden Computer Treasures for Financial Executives," Sept. 27; "Engineering and Scientific Applications," Oct. 4; and, "Far Out APL," Oct. 11.

Sessions start in late afternoon and continue until 10 p.m. at the Hewlett-Packard Data Center here in Fullerton. The \$48 registration fee for each seminar includes a buffet dinner, the APL seminar coordinator said from 1430 E. Orangethorpe Ave., Fullerton, Calif.

Productivity Ideas Offered

MCLEAN, Va. — Courses on DP productivity improvement are being offered by Johnson Systems, Inc. this fall.

Johnson schedules three consecutive courses each week, including one on the basics and another on advanced techniques for use of the company's Job Accounting and Reporting System (Jars) package.

The third course is not Jars-oriented. Topics include Computer Performance Management, Hardware/Software Planning and Evaluation and Design and Implementation of a Data Center Chargeback System.

The Jars courses are included in the \$295 fee charge for single courses, the spokesman noted from 8400 Westpark Drive, McLean, Va. 22101.



VOLUME KEY PUNCHING
(402) 592-1686



"QUALITY AT LOWER COST"

AMERICANA KEY PUNCH
4345 South 89th St.
Omaha, Nebraska 68127

SEMINARS

Seminars on Production Planning Inventory Control Systems will be given by Management Technology Incorporated in Cincinnati, Ohio on Wednesday, September 28 and in Grand Rapids, Michigan on Wednesday, October 12. Reservations are necessary. There is no charge to attend. For information contact Jerry Carter at (616) 531-5397 or write M.T.I., P.O. Box 8471, Kentwood, Mich. 49508.

SALE

DECprinter I Model LA 180 HIGH SPEED PRINTER

\$2,850.00 ea.

Complete with EIA Serial I/O Interface

\$2,500.00 ea.

You provide interface

FULL DEC Warranty Terms:

Two weeks A.R.O.

F.O.B. Park Ridge, Ill.

CASH WITH ORDER

Also available: LA 36, LS 120, VT 52, 1103, Diablo 1620, Cassette & Floppy systems, TI 745, TWX/DDD Alternates, TTY-43 & Couplers.

MANAGEMENT RESPONSE CORP.

660 Busse Hwy.

Park Ridge, IL 60068

(312) 698-3377

IN WATS (800) 323-2135

FOR SALE/LEASE

DEC LSI 11®
PDP 11V03 SYSTEMS
LA 36 DECwriters
LA 180 * VT 52
In Stock For
IMMEDIATE DELIVERY
Call: Glenn Burnett


UNITRONIX CORP.
1081 U.S. Hwy 22
P.O. Box 6515
Bridgewater, N.J. 08807
(201) 725-2560

Where do leading users of successful DB/DC systems go each year?



CINCOM KNOCK-ABOUT/77 AGENDA At-a-Glance

GENERAL SESSION										Oct. 9 - 12th		
Monday 10/10/77	Motivation: New "Takings" and Directions	Generalized Table System	Cincom Involvement: Minicomputer Marketplace	Data Base Dictionary Driven Software	Total Enhancement Report: DOS 370/360	Federal Government Special Interest Group	Privacy and Security Considerations	New Customer Orientation Session				
	Stress Management in Organizations	Educational Users: Special Interest Group	Product Announcement: Data Entry & Collection (ENV/DATA)	Improving your Technical Writing	Recovery & Restart for On-Line Data Bases	User Software Exchange Program	System/3: Special Interest Group	Evolution of an Information Resource A Case Study				
Wednesday 10/12/77	A System Approach to Data Base Design	Distributive Processing and the Data Base	Relational Systems: A Management Perspective	Evaluating the Effectiveness of The Data Base Administrator	Human Considerations in On-Line Systems Design	Programmer Productivity: Organization & Environment	Product Manufacturing: Applications	Structured Programming in its COBOL Environment				
	Product On-Line Program Library Maintenance System	Banking Users: Special Interest Group	VSAM User Experience	Data Base Applications on Minicomputers	The Politics of Planning	Total Enhancement Report: OS 370/360	Effective Communication: The Power of Wordless Persuasion	Concepts of On-Line Systems Design				

Cincom Systems' Knock-About . . . has truly become the premier forum for the exchange of information between successful implementors of data base/data communications systems.

Over 600 Cincom customers will gather at Knock-About/77, October 9-12, to attend and participate in 75 sessions presented in 8 concurrent tracks. The breadth and depth of the agenda (sample above) will enable each person to tailor a meaningful program to his or her professional responsibility . . . manager, system designer, programmer, data base administrator, on-line specialist, etc.

Special interest groups have been scheduled to provide the opportunity for industry-oriented interaction and in-depth discussions of subjects of communication software, we hope to see you at Knock-About/77. If your organization's DB/DC success story in time for presentation

considering data base or data communication software, why not contact Cincom Systems immediately. We can help you prepare your organization's DB/DC success story in time for presentation at the next Knock-About (April, 1978).



Cincom Systems, Inc.
We Create Efficiency

34 Offices in major U.S. Cities & Worldwide
2300 Montana Avenue, Cincinnati, Ohio 45211
513/662-2300

7
UM

Computer Professionals...

**Your career is 1/3.
Your life is 2/3.**

**You'll all like
NCR-Wichita.**

We provide a state-of-the-art challenge in realtime architecture, develop network design and communication control for distributive processing in a revolutionary data processing minicomputer environment. Here you are given the chance to create and are treated as the unique individual you are. In our metropolitan location, the old west hospitality still prevails. In the midst of modern shopping centers, great restaurants, theatre groups, 52 parks, a solid school system and an opportunity for continuing education at three state universities. You can see the night sky like you have never seen it before and if you like outdoor sports, you will find this location gets your muscles working up to par. The people are friendly, the air clean, the water pure and there is plenty for all. Some of our opportunities are:

COMPILER DESIGN PROGRAMMERS

Serve as a team member for design development and testing of BASIC, RPG, COBOL, Compilers.

OPERATING SYSTEMS

Senior level Analyst with minimum of 6 years experience in minicomputer based interactive systems development. Responsibilities will include system architecture for an interactive system currently under development as well as being a major contributor to system enhancement for other development projects.

DESIGN AUTOMATION ENGINEER

Five years experience, scientific programming and BSEE. Develop and enhance logic simulation, test generation, P.C. layout aids and automated documentation systems.

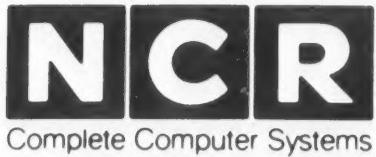
WE'RE WORTH AN EXTRA-SPECIAL LOOK...

Get in touch today

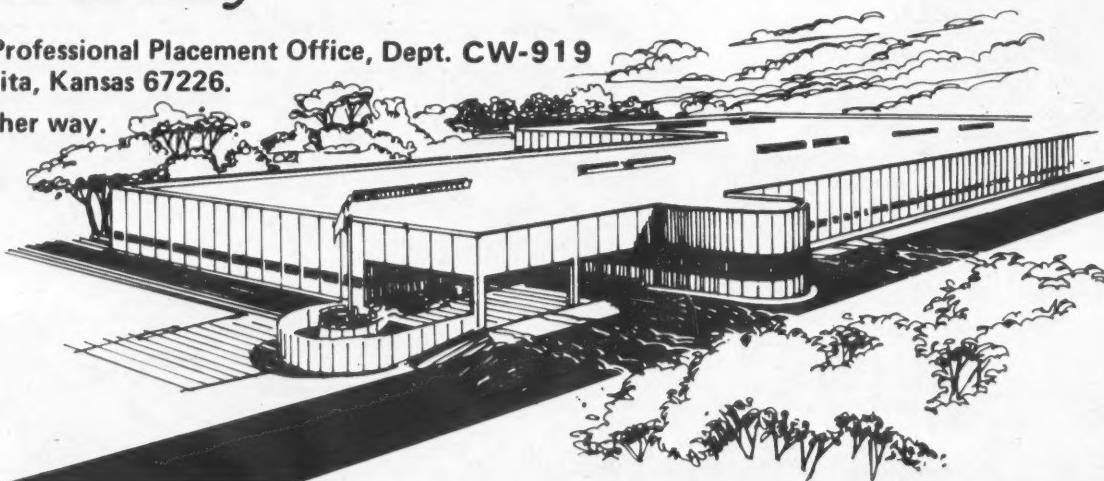
By Phone: 316/687-6192

By Resume: Mr. Jerry Long, Professional Placement Office, Dept. CW-919
3718 North Rock Road, Wichita, Kansas 67226.

You'll get complete details either way.



An Equal Opportunity Employer M/F



But PADs are Coming

X.25 Seen Awkward for Data Net Users

By Ronald A. Frank

CW Staff

TORONTO — The migration to packet switching is "particularly awkward" for data communications users because terminals adapted to the X.25 protocol standard are no longer operable on private lines or switched circuits, according to Louis Pouzin of France.

Speaking at a recent Conference here, Pouzin, for the French research institute IRIA, said the recent adoption of X.25 as a packet network standard has led computer terminal suppliers to introduce a variety of network architectures in answer to IBM's Systems Network Architecture (SNA).

"Every manufacturer is developing systems designed to tie up customers in a maze of specific products, all cunningly interdependent," Pouzin said.

The X.25 protocol allows setting up and clearing connections through virtual circuits. The virtual circuit is like a switched connection except that it is virtual. In terms of service characteristics, X.25 imposes transit delays typically between .5 sec and 1 sec; fixed packet formats; transmission procedures; several connections multiplexed on a single access circuit; and no error control end-to-end, Pouzin said.

Total Incompatibility'

The X.25 protocol exhibits "total incompatibility" with previously defined public data networks, and the number of deficiencies identified with it "foretells a substantial revision," he said.

Since X.25 does not fit any existing equipment, it "is not very saleable." Because of this, the carriers have introduced the Packet Assembler/Disassembler (PAD), which is implemented in a terminal controller. Terminals supported by the PAD controllers must be either start/stop type operating at 110 or 300 bit/sec and must use Ascii code, Pouzin said. This year will be the year of the PAD within CCITT, with a strong drive to get a specification approved, he predicted.

On the other hand, the subject of X.25 consistency with other data communication services will not be given much attention within the standards-making body this year, he said.

The adoption of X.25 by the CCITT was the result of "worldwide salesmanship and rough pushing" which led to unanimous approval, although no votes were recorded, Pouzin said.

The standard was approved through the combined efforts of Bell Canada, Telenet Communications Corp. and the French and United Kingdom postal administrations. The X.25 protocol is basically a "carbon copy" of a procedure designed by Telenet

for its own use and Telenet was the most influential carrier favoring its adoption. This was because Telenet is the only carrier operating in the packet switching area without cross subsidization.

Describing Telenet as a specialized carrier in the U.S., Pouzin said it does not offer a "full range of consistent public services." But turning a Telenet product into a CCITT recommendation "is certainly a highly prized reward for the company and explains why packet-switching services are out of context with other public data communications services in other countries," he said.

Telenet provides everything either as part of its network or as software packages for customer equipment. But the carrier is not selling a virtual circuit service. Instead, it is offering remote terminal handling and procedure conversion.

The next logical step will be a complete service for users in one of four one possible forms:

- Computer manufacturers provide converters and remote controllers to go with them.
- Entrepreneurs build and sell/rent converters and remote controllers.
- Entrepreneurs put up all necessary gear and sell composite services based on public data communications services.
- Carriers provide composite services.

The carriers will be dependent on the vendors' willingness to put X.25 interfaces in their products. The carriers would like to impose the network terminal access methods on the manufacturers so that "the whole terminal-handling business falls under carrier control," Pouzin said.

Users are realizing that building a system out of heterogeneous components may result in considerable economies. But in order for this to happen, common protocols are needed and boundaries of responsibility must be clearly defined, he said.

Terminal-Based Turnkey Helps Pharmacy With Recordkeeping

FORT WORTH, Texas — Pharmacists are discovering that a computerized communications network can provide a new prescription for an ailment as old as drug stores themselves.

That "ailment" is an overabundance of repetitive, routine, time-consuming tasks like typing prescription labels, storing patient profiles and family records, updating inventories and drug prices and processing Medicare and Medicaid paperwork.

The remedy is a \$20,000 turnkey minicomputer system called "System 31", which features a mini-CRT terminal/keyboard by Informer, Inc. of Los Angeles.

Operated by V.C. Brown, Inc. of Fort Worth, the system serves nearly 100 pharmacies, and Brown officials claim the market is growing. The system, which has taken six years to develop, incorporates a Computer Automation, Inc. LSI-2 minicomputer, a Centronics Data Computer Corp. and the Informer Models 301 and 302 mini-CRT display screen and keyboard.

Dalton Carter, who owns Carter Pharmacy in Fort Worth, is so proud of his computer he advertises it in the Yellow Pages. His ad reads "Complete computerized prescriptions records for major medical and income tax."

"The first year I had the computer," Carter said, "I watched closely to see if it really would pay for itself. In that first year, I found that it saved me \$11,500 by just keep-

ing up with wholesale price increases on refills, not to mention the relief on handling the paperwork for Medicare and Medicaid."

Carter, whose small pharmacy fills an average of about 100 prescriptions a day, said he had four clerks to handle the third-party paperwork before he began subscribing to the computer system. Today, he employs two clerks.

"It's obvious that I can take two salaries and pay for the computer," he said. "When I came into the business, wholesale drug prices hadn't changed in 40 years. Now, with everyday's mail, we get price changes. And with welfare, etc., you have such a low margin that you've got to grab every penny to make a profit."

Carter said the V.C. Brown System 31 wouldn't be the same without the small Informer terminal. "I love it," he said. "It's obvious why. The terminal takes up very little space. There's no point in its being any bigger than it is. You've got all the information you need, and no more."

Bob Glenn, Brown's national sales manager, said one of the mini-CRT terminal's advantages is its smallness. "You're talking about counter space that the pharmacist uses for everything," he explained. "Informer's terminal is 6 by 20 in. and has a pedestal-mounted six-in. CRT screen that stands 10 in. tall. It weighs 10 pounds and is easily moved around."

(Continued on Page 45)

COMMUNICATIONS

FIGHT TERMINAL INFLATION

with NATIONAL'S nationwide terminal services, mixed vendor products and continuous product maintenance.

We offer easy upgrades, easy terms, rapid delivery and installation (*usually from stock*)

So fight Terminal Inflation by dialing (800) 243-9006 NOW
(in Conn. 203-325-3831) before you turn this page and forget!

OFFICES LOCATED IN BOSTON—NEW YORK AND OTHER MAJOR CITIES



TECHTRAN
NEW YORK COLISEUM
OCTOBER 17-20, 1977
See us at Booth #341
(815-8410-8400-8420-8421)



(TI-745 TI-743)
National Computer
(our very own)
LA-36 ASR
NEW
(NCC 1050 Reader Punch)



(ADM 1-A/2-A/3-A/4)
NCC
(Modems-Couplers)

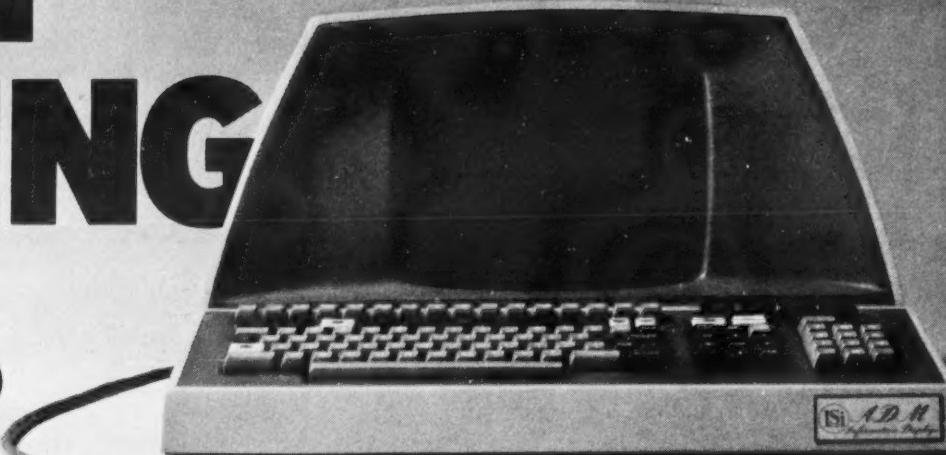


(Hi Type I and Hi Type II)

C
NATIONAL COMPUTER COMMUNICATIONS COMPANY
26 Sixth Street
Stamford, Connecticut 06905

1
1
3
8
SEP
1
9
7
7
UMI

NOW, LEAR SIEGLER AND BURROUGHS ARE ON SPEAKING TERMS.



You're probably very happy with your Burroughs mainframe.

But you'd undoubtedly like to have the versatility and dependability of Lear Siegler terminals. If only they were compatible with your present system.

Now they are. Complete with standard Burroughs polling and address line disciplines.

What's more, the ADM-2B's forms mode capability is compatible with the TD-820.

The ADM-2B gives you full text editing capabilities. Including erase to end of line/field/page. Insert and delete character and line. Blinking and blanking fields. And tabbing.

Just flick a switch and you can convert the ADM-2B to a standard ADM-2 with Burroughs line discipline.

Line diagnostic mode is switch selectable — which makes it extremely valuable for troubleshooting.

Of course, there's all the support that Lear Siegler is famous for. Throughout the United States and in many foreign countries.

\$2485.

That's the full price. Including serial printer port. Numeric keypad. 24x80 character screen. 16 function keys. 110-9600 baud. RS232 interface. Burroughs two-wire direct connect is available as an option.

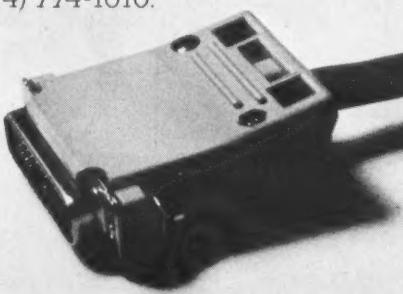
The fact is, Lear Siegler's new ADM-2B terminal gives you the best of both terminals. So you can use it right alongside your present Burroughs terminals and mainframe.

So rest easy, Burroughs users. Because now Lear Siegler speaks your language.

For more information contact:
Lear Siegler, Inc., E.I.D./Data Products, 714 N. Brookhurst St., Anaheim, CA 92803; (800) 854-3805. In California (714) 774-1010.



**THE ADM-2B.
SMART TERMINAL.
SMARTER BUY.**



Clients Do Own Banking With Wall-Mounted 'Teller'

S. LAWRENCE, Mass. — Bay State National Bank has installed an IBM self-service banking terminal at its Winthrop Ave. branch here.

Called Instabank, the IBM 3614 consumer transaction facility has been installed in the branch's outside wall, permitting the bank's customers to make the following transactions:

- Withdraw cash in \$5 and \$20 denominations from savings or checking accounts, up to a daily limit of \$250 from either account or a combined total of \$350.
- Make deposits to checking or savings accounts.
- Transfer money from one account to another.
- Make installment loan, mortgage, Master Charge or club payments.
- Obtain current checking or savings account balance.



Bay State National Bank has installed an IBM 3614 consumer terminal at its Winthrop Ave. branch in South Lawrence, Mass., as part of an IBM 3600 finance terminal system.

"Instabank provides customers with the convenience and privacy of 24-hour banking every day," according to assistant vice-president John C. Hersey.

To initiate a transaction on the 3614, a customer inserts a plastic magnetic stripe identification card — called Instacard — into the terminal, which is connected to the bank's central IBM 370 CPU. After the card is validated, a display panel instructs the customer to enter a secret code number at the keyboard.

Then, guided by messages on the display panel, the customer presses a series of keys to indicate the transaction and its amount. After each withdrawal, the system debits the customer's account and returns the card.

When depositing funds or making

Spectron Devices Gain Send/Receive Option

MOORESTOWN, N.J. — The Spectron Corp. has introduced a send/receive option for its T-511 tape unit.

Data recorded on tape by a Spectron Datascope D-601 or on a T-511 can be transmitted between two T-511s equipped with the option.

Data can be sent between sites in simplex operation, a spokesman said.

The purchase price of the option is \$800; previously delivered units can be retrofitted at a cost of \$960, the firm said from 344 New Albany Road, Moorestown, N.J. 08057.

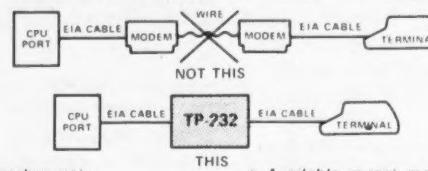
loan payments, the customer presses the appropriate keys and inserts an envelope — containing payment documents, checks or cash — into a covered deposit slot. Customers also can make payments by inserting an envelope containing a payment stub or coupon and keying instructions to deduct funds from their checking or savings accounts.

The bank also has begun using teller-operated terminals in all 10 of its branches. All units are part of the IBM 3600 finance communication system.

The terminals include keyboard display units and passbook/document printers linked to the central computer, the bank said.

TP-232 MODEM SIMULATOR

The TP-232 Modem Simulator replaces a pair of modems in local, in-house applications, as shown below. With its wide variety of strap selectable options, this unit is a versatile tool for system check-out as well as an economical replacement for a modern pair.



FEATURES

- Replaces any modem pair
- Synchronous or asynchronous operation
- Selectable data rates through 19,000 bps
- May be used in continuous carrier or polling systems
- Available in rack mount and stand-alone configurations
- Regenerates EIA signals allowing greater cable lengths
- RS-232 C compatible
- Digital data loopback

TP TeleProcessing Products Co.

Local Data Distribution
11163 West Pico Blvd., Los Angeles, CA 90064 • (213) 478-8988 • (213) 879-9045

BANISH ABENDS FOREVER.



And say hello to Computer-Link's complete Data Media Maintenance Systems.

Take a good look at the computer re-run time your ABENDS eat every month and then tell them to start packing their bags. With Computer-Link's complete Data Media Maintenance Systems, tape, disc and ribbon problems are fully evaluated and corrected giving you throughput instead of re-runs, reliability instead of shutdowns.

Features like Intensive Clean on the Tape Evaluator/Cleaner put even heavily contaminated tapes back on-line without re-runs. And its five tape evaluation tests find the causes of more ABENDS than any other similar unit.

Say goodbye to crashes with the Disc Inspector/Cleaner. Anywhere in the field it wipes away the slight-

est traces of fingerprints for constant head and disc protection. And for trouble-free print runs, Computer-Link's Line Counter records only printed lines for optimum ribbon performance and replacement.

Find out how much more reliable your tape or disc operation can become by filling out the coupon. Immediate detailed information is available by calling toll-free: 1-800-225-1616.



COMPUTER-LINK CORPORATION

14 Cambridge Street, Burlington, MA 01803.

Please send a brochure on: Tape Evaluator/Cleaner
 Disc Inspector/Cleaner Line Counter

Name _____

Address _____

City _____ State _____ ZIP _____

Company Name _____

V
1
1
3
8

S
E
P

1
9

7
7
UMI

More Hookups Under Way

SNA-Based Net Links Mexican Bank Branches

Special to CW

A sophisticated tele-information network based on IBM's Systems Network Architecture (SNA) concept (and utilizing Vadic-licensed 1,200 bit/sec and 2,400 bit/sec CCITT-compatible modems) is now in use at Multibanco Comermex of Mexico City. The system places Multibanco Comermex in the lead within the Mexican banking industry for farsighted uses of data communications technology.

A desire to provide better daily services motivated the bank's directors to implement a comprehensive computer service expansion plan.

A fundamental requisite was a greater integration within the bank's offices throughout the country over a reliable data transmission network.

Once such a network was established, Multibanco Comermex decided to install backup systems both at the computer and at the telecommunications equipment levels.

To obtain the high levels of efficiency required, the use of distributed intelligence technology was supported by a high-level synchronous communication protocol.

One of the bank's objectives was to use modems manufactured in Mexico. It contacted the General de Telecomunicaciones S.A., who supplied modems manufactured in Mexico under license from Vadic Corp.

Two types of modems were licensed by Vadic: the VA-1200L CCITT V.23-compatible 1,200 bit/sec modem; and VA-2400L CCITT V.26-compatible 2,400 bit/sec modems.

The network is supported in a data processing center (CPD) and a data telecommunications center (CTD) located in Mexico City.

Multibanco Comermex also offers a consultation and protection telephone service to remote and branch offices, in case of catastrophic failure, such as power outage, at a remote office.

Installation of controls for remote terminal management of provincial branch offices has been planned, and integration of remote offices in the country's interior has already been started.

Network Configuration

The Multitronic network, based on the IBM 3600 financial system, includes an IBM 370/125, a 370/135 CPU and two IBM 3704 communication processors to provide redundant on-line operation.

Normally, the 370/135 is used on the first and last days of the week and on the 15th and 30th of each month (the bank's pay days).

Each 3704 communications processor is capable of managing the entire network, because of data divider bridges, following the VA-2400L modems.

The bridges accept four IBM terminal controls, backing up both the 1,200- and 2,400 bit/sec modems, which are housed in 16-channel multiple mounting racks.

The telephone lines are backed by a half-duplex line which is normally connected to the CTD in case of emergency.

Because of multipoint operation, the network can maintain eight branch of-

fices with each 3601, of which there are currently nine in the system.

Emergency measures may also be taken to prevent any one branch in the multidrop loop from blocking the other branches in the same loop.

At present, the system has 46 branches, most of them in the metropolitan area of Mexico City. The system contains 140 data terminals linked by the Vadic-licensed modems.

The 1,200 bit/sec modems are used at the branch level, while the 2,400 bit/sec modems are used at a higher level. The system is used for debits, credits and inquiries on checking and savings accounts and loans.

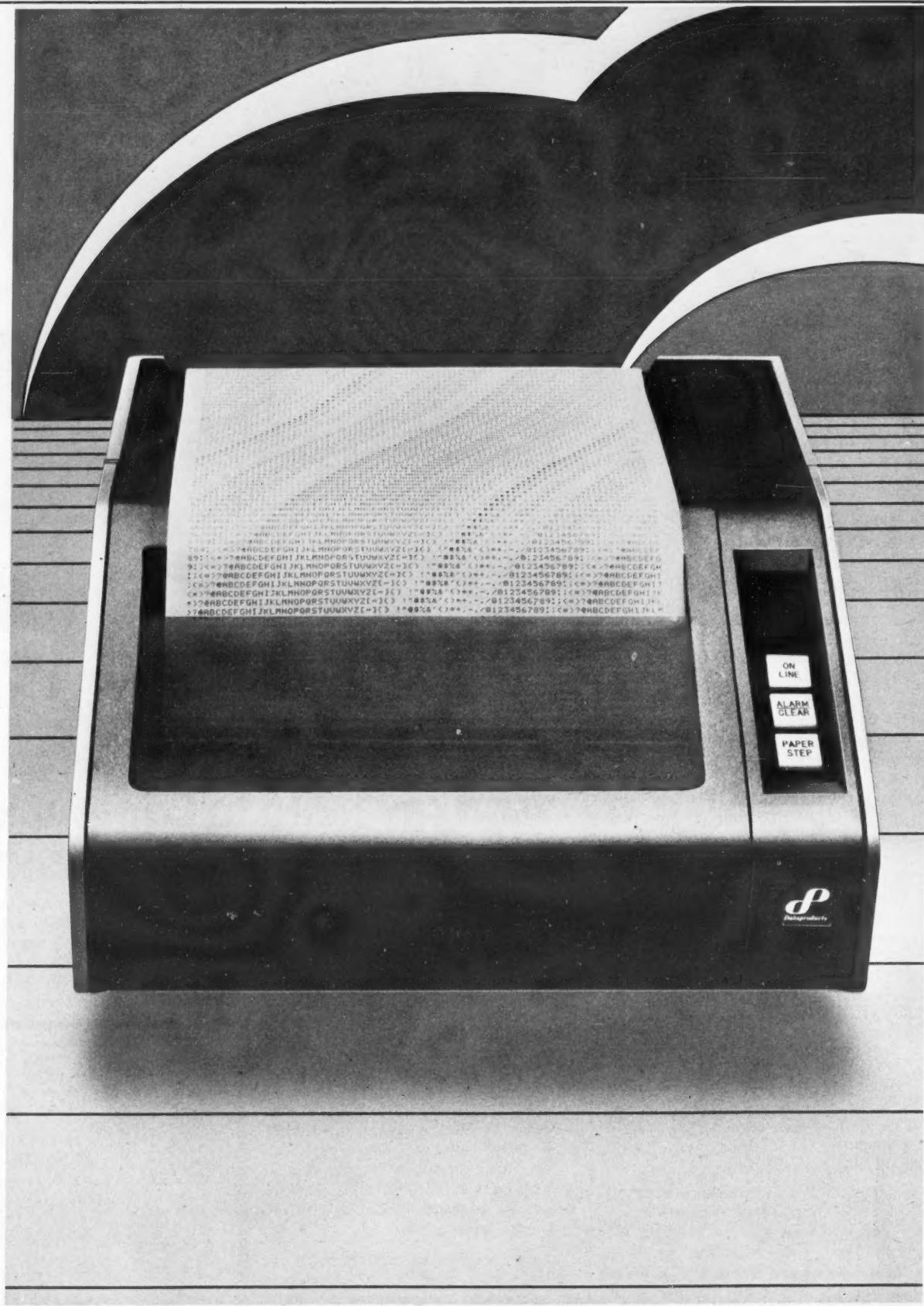
Software used is IBM's Virtual Telecommunications Access Method/Extended Telecommunications Module (Vtam/EXTM) in the 370 CPUs Network Control Program/Virtual Storage NCP/VS in the 3704 communications processors; and Synchronous Data Link Control (SDLC) protocol for data communications. SDLC is compatible with the International Standards Organization's (ISO) proposed High-Level Data Link Control (HDLC), which has been adopted by France, Canada and other countries as a base for their public data networks.

Informatica y Telecommunicaciones S.A. is also involved, developing an ef-

ficient, simple system for switching to back-up equipment, plus a diagnostic and control system with a display panel to inform the CTD operator of the network status and to provide control of back-up switching from the panel.

Analog signal levels, noise levels on the telephone lines and digital interface signals from the 1,200- and 2,400 bit/sec modems can be monitored.

The Multitronic network reportedly is the first of its kind in Latin America to employ SNA. With this architecture, Multibanco Comermex achieves better integration with its finance group and can offer better service to clients and officials alike.



Services Firm Credits Net With Revenue Rise

SILVER SPRING, Md. — Because it converted to a national data communications network, a remote computing services firm here will double its revenues during the next year, the company's president predicted.

Dialcom, Inc., began using the Tymnet, Inc. communications network after executives in the computing services firm realized they would have to make Dialcom's services more accessible to its customers, which include government agencies, financial institutions and businesses.

"Tymnet offered the only network service which met all our criteria," Dialcom president Robert F. Ryan recalled.

To save money, Dialcom in the past installed local dial-up lines in only a

few high-density cities like Baltimore, New York, Philadelphia, Minneapolis and Pittsburgh. Because of rapid company growth and customer demand for access in other U.S. cities, however, the firm's management conducted a study of national network common carriers in early 1976.

Criteria for the selection of a network included the ability to base the network at Dialcom's computer facilities here, to provide Bell 113B-compatible transparent hookups and to cover many major U.S. metropolitan areas.

Even more important, the company demanded reliability and performance to ensure a level of quality acceptable to Dialcom's network customer base, Ryan said.

"An important reason we selected Tymnet," he continued, "was its history and experience with our industry. Because Tymnet has conveyed the services of Tymshare, Inc., for many years, it was my feeling that Tymnet would relate to the problems of a time-sharing concern better than the other common carriers."

Node Replaced

During December 1976, when Dialcom began using the Tymnet operation, surging volume forced the company to replace the original network node — a Varian 620L with 30 ports — with a Varian V72, 62-port configuration. Management attributed the change to increasing customer additional access points. Approximately

50% of Dialcom's customers draw usage in more than one location.

The network allows Dialcom to compete on a national level in additional areas of marketing like data collection and accessing of common data bases for large multi-city firms. By using Tymnet, Dialcom believes it can better serve the associations and corporations utilizing its software products, Ryan noted.

Dialcom's most widely offered services include a word processing correspondence tracking system and Federal Assistance Programs Retrieval System for state and local government agencies. It also offers software packages for business, accounting and engineering.

Dialcom does its processing at its dual-computer facilities here, which house four Honeywell 1648 time-sharing systems. The company plans to install an additional Honeywell 1648 system this year.

The company's 1976 estimated revenues will exceed \$1.5 million, an increase of approximately \$500,000 over the previous year.

Pharmacy Using Turnkey System

(Continued from Page 41)

System 31's disk memory stores about 70,000 accounts, enough to last the average pharmacy two years without purging. When a customer comes in for the first time, a druggist enters information like doctor's name, customer's name and account number, code of directions, allergies, drug name, quantity, price, cost, number of refills, predetermined fees and number of labels to print into the system.

When an account is established, a refill or new prescription takes only a few seconds.

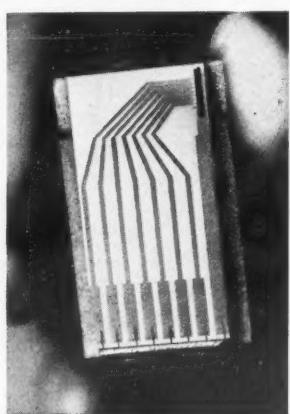
Among its other functions, the system checks drug prices to ensure they are current; checks refill numbers to be sure the authorized number of refills have not been exceeded; updates family records; creates billing files for third-party payment; and prints prescription labels.

Another advantage of the CRT terminal is the ability to program private reminders on various customers, Glenn said. "You have all sorts of people walking into pharmacies," he explained. "You may only want to accept cash from some. Others may be suspect drug abusers or shoplifters. You can get a private message on the screen whenever that customer's number comes up and it will never be printed anywhere else that it could cause you embarrassment if it got into the customer's hands."

Carter described the network as nothing more than a sophisticated file clerk and filing system, which is exactly what he said his pharmacy needed. "Previously, we had two manual file systems, and if you had 10 or 15 refills on a prescription, you thumbed through them so many times you couldn't read the number," he recalled.

"Now, the pharmacist just takes the label off the printer and it's legible, the information is there in the same form every time and the drug prices are current."

DATAPRODUCTS' NEW ERA T-80 THERMAL PRINTER: 80 CPS FOR THE PRICE OF 30.



Dataproducts' New Era T-80 thermal printer is nearly three times faster than other thermal printers.

Yet it costs about the same.

What's more, the T-80 offers you Dataproducts dependability,

assured by a smartly conservative design, a unique solid-state print head, and a minimum of moving parts.

Noise, too, has been minimized.

The quiet T-80 hums at 80 cps, so it can be seen but barely heard.

And head changing is a snap.

Any operator can put in one of our incredibly small, self-cooling heads in a snappy 10 seconds.

Our New Era T-80 thermal printer, with its parallel or optional RS-232-C interface, is ready to tie into your CRT, your terminal, or your processor.

The T-80: fast, inexpensive, quiet, and reliable.

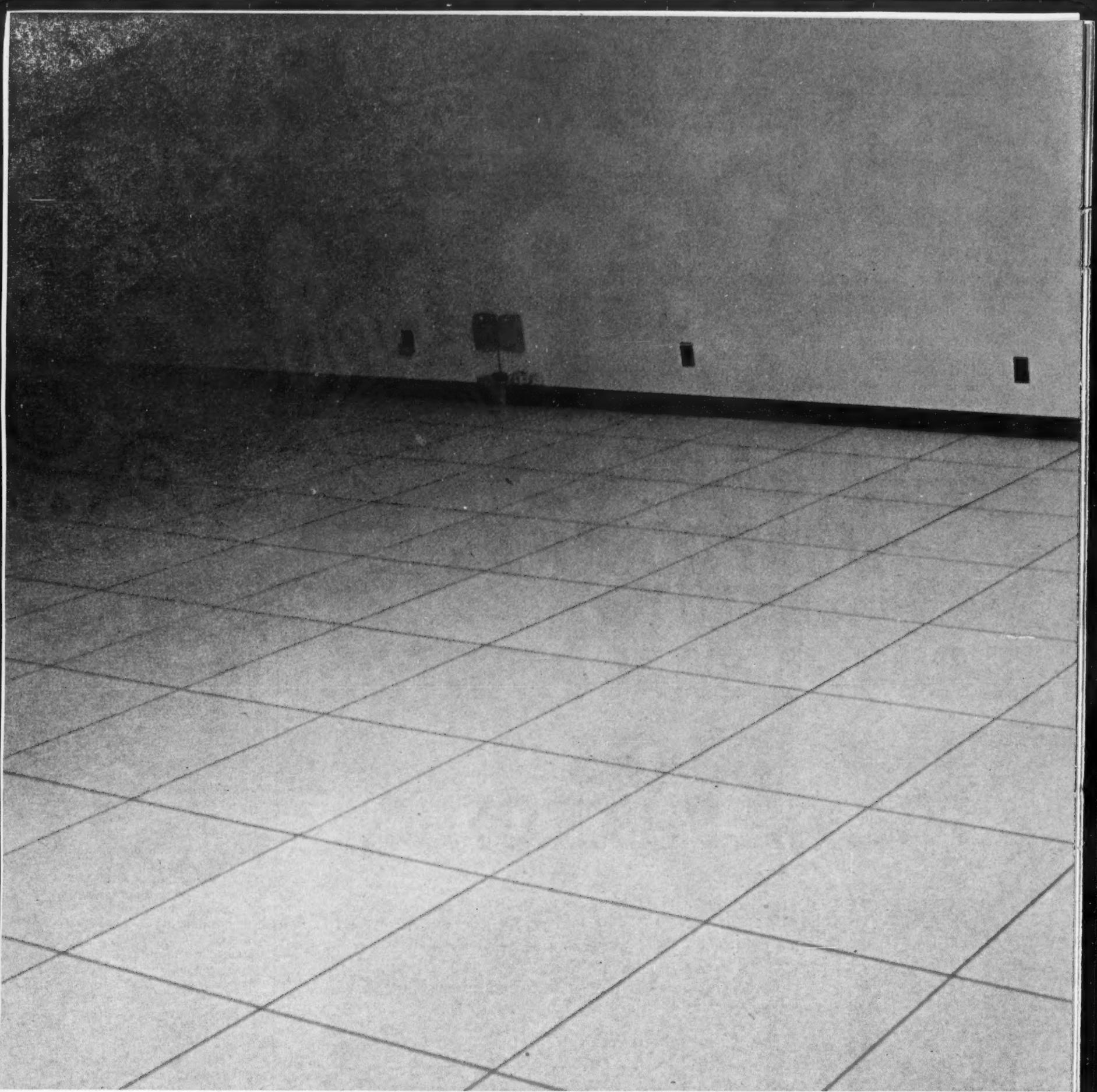
Altogether, an unbeatable combination.



THE PRINTER COMPANY

NORTH AMERICAN SALES HQ: 6219 De Soto Avenue, Woodland Hills, CA 91365, (213) 887-8001; Telex 69-8492.
EUROPEAN SALES HQ: Darmstaedter Landstrasse 199, Frankfurt, W. Germany, Phone 681034; Telex 841-416344.

V
1
1
3
8
S
E
P
1
9
7
7
UMI



You don't have to think big

One of the biggest names in big computers just became one of the biggest names in small computers.

Because Sperry Univac just acquired Varian Data Machines. Lock, stock, and slide rule.

From now on, Varian's complete line of mini's will be brought to you by the mini-computer operations of Sperry Univac.

The whole family—from the world's first mainframe on a board to the top of the line—will carry the Sperry Univac label.

Of course, these machines were always a good buy. But now they're assured of all the service and support that Sperry Univac can command. All the former VDM employees, all the dollars, all the dedication.

What's more, we're totally committed to



to think Sperry Univac.

supporting and enhancing Varian's current product line.

Write to us at Sperry Univac Mini-computer Operations, 2722 Michelson Drive, Irvine, California 92713. Or call (714) 833-2400.

The fact is, Sperry Univac is going to be a big success in small computers.

Sperry Univac. Mini's that think like mainframes.

SPERRY + UNIVAC
SPERRY UNIVAC IS A DIVISION OF
SPERRY RAND CORPORATION

Infoton Adds Two CRTs

BURLINGTON, Mass. — Infoton Corp. recently introduced two CRT terminals. The I200 is a Teletype Corp.-compatible display terminal with standard bottom-line entry and full-screen entry operating modes.

Features of the terminal include a 1,920-char. display in a 9 by 9 dot matrix format, RS-232C and current loop interfaces, 16 switch-selectable transmission rates from 50- to 19,200 bit/sec and a capacitor scan detachable keyboard, according to an Infoton spokesman.

Command functions of the I200 enable X/Y cursor addressability, erase line or screen, and keyboard lock or unlock, he said.

Options available include upper/lower case printing, a printer inter-

face, answerback, numeric keypad, function keys and non-scroll page mode of operation, Infoton noted.

The Model I400 is said to be a multifunction CRT terminal which utilizes the full ASCII code set and is microprocessor based.

Features of the terminal include all those standard on the I200, as well as character or block transmission, cursor control cluster, a numeric pad and editing capability, the spokesman noted.

Additional command functions on the I400 include cursor sense, reverse video, and underline field.

The I200 costs \$1,195 in its basic form; and the I400 is priced at \$1,595, the spokesman noted from Second Ave., Burlington, Mass. 01803.

Microprogrammed System

CRT Does Publishing Jobs

CORNWELLS HEIGHTS, Pa. — Delta Data Systems (DDS), has introduced a video display terminal that its manufacturer claims minimizes errors in text processing applications. Dubbed Delta 4300E, the microprogrammed terminal incorporates a 4K-char. memory expandable to 8.5K char.

Designed exclusively for organizations like newspapers, publishing houses and other communications firms, the terminal provides text-manipulation features that include automatic word wrap, automatic ragged right sentence and paragraph justification and automatic justification of new insertions, the firm said.

In addition, four automatic search

modes are possible including searching test for a specific word or word string; search and replace each occurrence in text with a new word or word string; search and replace upon request; and search and delete each occurrence in text of a specific word or word string.

Moves, Copies Text

Other features include the ability to move/copy/delete any defined text from the terminal's memory. The unit has an automatic carriage return. Memory preservation prevents loss of data and signals the operator when a character is added or inserted into a full memory, DDS added. To help conserve memory, a data compression code eliminates trailing spaces.

Like the firm's Delta 4000 microprogrammed video display terminal, the 4300E offers a 128 upper/lower case character set scroll up or down, full tab/clear control, end of data tab and protected text (format) control. Communications speeds up to 9,600 bit/sec are possible with the unit and a serial printer port for hard copy records is also available as an option.

Display Modes

Four display modes — normal, reverse, blink and reverse with blink — aid text processing jobs by calling attention to specific information on the screen, DDS said.

Used with a printer, the terminal can be used to prepare documents at insurance companies and financial institutions, research organizations and government agencies of all kinds.

The terminal displays 25 lines of 80 characters each. An exclusive paging feature displays all the characters in memory — regardless of the number of lines — in any format, without computer memory or regard to the number of lines of information transmitted, DDS claimed from Woodhaven Industrial Park, Cornwells Heights, Pa. 19020.

WUI to Start Serving Japan

NEW YORK — Western Union International, Inc. (WUI), a unit of WUI, Inc., and Kokusai Denshin Denwa Co., Ltd. (KDD), the international telecommunications entity of Japan, have agreed to begin operations for private line and other services. WUI will apply to the Federal Communications Commission soon for the necessary authority, a spokesman said.

Japan was the only major country not served directly by WUI. KDD provides all international telecommunications services, telephone and record, between Japan and the rest of the world.

KDD and WUI will offer private leased-channel services to commercial and government users via both cable and satellite.

Private leased channels constitute WUI's second largest service area, next to Telex, which is not covered by WUI's agreement with KDD. KDD and WUI are also currently exchanging views on a future data transmission service between Japan and the United States, WUI said.

OCR SAVES MONEY

How Westinghouse Saves Over \$10,000 A Month With OCR

Westinghouse Credit Corporation's business is financing at both retail and wholesale customer levels. Before OCR, credit applications for computer input were keyed from forms manually generated at a multitude of field offices.

Westinghouse's George Jordan was instrumental in replacing this costly and cumbersome keypunch operation with an Optical Business Machines Laser OCR-One optical character recognition system and seven newly designed forms. About 25,000-30,000 of these forms are scanned every month. The result . . . the keypunching staff has been reduced by over 50%. The savings from this alone amount to about \$10,000 a month! More than that, Westinghouse Credit has reduced their

reporting time by three days and has achieved much better control of their money.

For information on how you can cut data entry costs with the Laser OCR-One system, contact

**Billy Graham
Vice President/
Marketing**

**Optical Business
Machines, Inc.**

804 West New Haven Avenue
Melbourne, FL 32901
(305) 727-1774

I'd like more information about the Laser OCR-One

- send descriptive literature
 have a salesman call me

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Phone _____

S



THANKS, HAZELTINE!

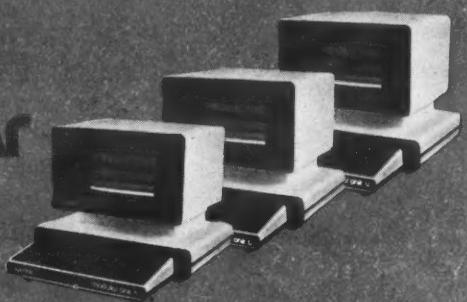
As operating management, we appreciate how you've helped us control costs, stay competitive, and increase our profitability!

A BUSINESS PROPOSITION
FROM HAZELTINE
CONCERNING POLLING NETWORKS
BUILT AROUND
BURROUGHS, HONEYWELL OR UNIVAC
COMPUTERS:

SAVE AS MUCH AS 50% WITH



**modular
one/
polling**



Hazeltine — A World Leader in Information Electronics for more than a half century.
Hazeltine Corporation, Computer Terminal Equipment, Greenlawn, New York 11740 (516) 549-8800 Telex 96-1435



Give us 3 minutes



and we'll show you how to cure your 2501 headache

We're that sure of our new 6501 Buffered Card Reader. Call us and we'll tell you more about how:

- The buffered DOC 6501 can be installed on ANY position on the channel and puts an end to channel OVERRUNS.
- The buffered DOC 6501 gently handles and increases the life of repetitively read card decks.
- The buffered DOC 6501 saves you 25% or more than a 2501.
- The buffered 6501 can be purchased or leased NOW.

If you aren't convinced in three minutes, we'll send you some buffered aspirin. With an unbuffered 2501 you'll probably need it.

Call John Sterling at (800) 327-6424 or (305) 724-1111.

DOCUMATION
INCORPORATED

Or call, Atlanta, GA (404) 955-0309; Boston, MA (617) 890-2650; Chicago, IL (312) 782-0551; Dallas, TX (214) 661-9902; Detroit, MI (313) 353-8181; Greenwich, CT (203) 869-4123; Hartford, CT (203) 278-2010; Houston, TX (713) 780-1432; Los Angeles, CA (714) 752-8782; Miami, FL (305) 592-9655; New York, NY (212) 695-4195; Oakbrook, IL (312) 920-0551; Philadelphia, PA (215) 574-0950; San Francisco, CA (415) 574-4060; Washington, DC (703) 356-2050. International Offices: London — Staines 61124; Paris 686 8207; Toronto (416) 622-8720; Germany 06 11/728 128; Spain 416 87 60.

SYSTEMS & PERIPHERALS

Helps Assure Data Security Bank's Film Stops Developing Problem

HALIFAX, Nova Scotia — The Bank of Nova Scotia, headquartered here has found an inexpensive solution to a potentially expensive problem — data security.

The problem was that confidential information shown on CRTs at teller stations could be seen by any customer standing in line.

"It wasn't long after our computer terminal was installed at a pilot branch in March 1976 that we realized we had a problem," according to George W. Tompkins, manager of implementation coordination. "I could read your business and you could read mine very easily."

This presented an undesirable situation since it varied with the traditional banking code of maintaining the security of customer records. "Because we were pioneers in this particular program, we had to find out for ourselves that a problem existed," Tompkins explained.

It wasn't the fault of the terminals, IBM 2970s, according to A.D. MacMillan, projects manager for corporate branch opera-



Pedestal-mounted terminals serve two tellers; this arrangement caused some of the data security problem faced by the bank.

tions. "It was simply a case of our having a unique requirement for a product designed for the industry at large. The problem was made more acute by our approach of using rotating pedestal bases for the terminals, rather than mounting them on the counter facing the teller," he said.

"The pedestals are set back from the counter and can be

turned from one teller to another. When the unit faced a teller, information displayed on the screen was visible to anyone in line at that window — the person's name, financial data and any messages.

"We began looking for remedies and obtained some quotes, but we had to move quickly. We were scheduled to have 440 of our 966 branches on

the system by mid-1977 and couldn't afford to have that unsatisfactory situation cropping up in branch after branch.

"Meanwhile," he added, "our instruction to the branches was 'Do not turn the terminals' — a restriction that proved awkward at times, but we had no choice."

The problem was solved at a cost of less than \$3 per terminal with sheets of light control film from the 3M Co. The film, a thin plastic sheet incorporating microlouvers, works like a tiny venetian blind to reduce glare, control light, improve contrast and control the viewing angle.

When placed in front of a lighted display, it directs light into a controlled viewing pattern and blocks out light from external ambient sources.

Film louvered at 0° restricts visibility to direct frontal viewing. Film louvered at 45° is used in certain branches where a cashier/teller system is employed; in those locations, terminals face the customer directly, but the angle of the louvers con-

(Continued on Page 56)

Bits & Pieces

Cleveland Society Sets Measurement Workshop

CLEVELAND — The Cleveland Engineering Society will hold a two-day workshop on computer measurement here Sept. 29-30.

The workshop, which will be directed by Donald C. Harder and David S. Hubbert, is designed for computer management personnel and capacity planning analysts.

The cost of the workshop is \$335, which includes luncheons, coffee breaks and all materials. Additional registrants from the same firm will be charged \$300; a 10% discount is available for teams of three or more persons from the same firm.

Registration information is available from the society's Education Office, which can be reached by telephone at (216) 361-3100. The society is at 3100 Chester Ave., Cleveland, Ohio 44114.

Brush Removes Static Charges

HILLSDALE, N.J. — The Texwipe Co. has introduced a static eliminator brush that reportedly eliminates the static charges that build up as a result of the movement of paper in hard-copy output devices.

The brush is a conductive-type device that collects static charges and "bleeds them to ground." The brush requires no chemical renewal and maintenance is nonexistent, according to the company.

The brush costs \$27 from the firm in Hillsdale, N.J. 07642.

Pericomp Hikes Crimper Price

NATICK, Mass. — Pericomp Corp. has increased the price of its magnetic tape crimper from \$28 to \$30.

The price hike is a result of increased production costs, a spokesman said from 14 Huron Drive, Natick, Mass. 01760.

Savings & Loan Goes In-House After 10 Years With Services

Special to CW

NASHVILLE, Tenn. — After relying on computer service companies for 10 years, the Fidelity Federal Savings and Loan Association here recently opted for in-house DP. The move was prompted by a desire to save money and increase management's flexibility and responsiveness to a changing financial environment, according to Garnett Cothorn, vice-president for computer operation.

"Just a few years ago we determined that we couldn't justify the cost of operating our own computer," he said. "Now it would cost us more to utilize an outside service."

"Furthermore, we have more flexibility, and we can prepare for electronic funds transfer, NOW accounts, variable rate mortgages and other likely trends — at our own pace," he added.

Fidelity has 10 branches supplementing the services offered at its 12-story main office in downtown Nashville. The branches extend Fidelity's service to a four-county area in mid-Tennessee. Another two branches are scheduled to open soon.

Based on his experience, Cothorn believes associations smaller than one-third Fidelity's size may now find in-house operations financially attractive.

"Computer systems continue reductions in costs," he explained. "Savings and loans that couldn't afford their own DP systems a few years ago can now save money by going in-house."

"Unfortunately, many associations stay with service companies simply because their cost assessment is based upon outdated information," he pointed out. "It's not that

(Continued on Page 52)



A display panel on the teller terminal provides the teller with step-by-step instructions for each transaction.

1
9
7
7
UMI

In-House DP Gives Savings & Loan Flexibility

(Continued from Page 51)

managers haven't been doing their jobs, but rapid changes have made it difficult for them to keep up-to-date."

Fidelity began planning its conversion in mid-1975. In April 1976, equipment installation was completed and the association began running parallel for its savings operation.

In less than three weeks, it was able

to balance to the penny and close out the old savings system. Loans were converted as of June 30, 1976, and both applications are functioning "admirably," Cothorn said.

Fidelity is leasing an NCR Corp. Century 151 computer with 128K bytes of memory and four spindles of disk storage; an NCR 640 printer for producing reports and other printouts;

and an accessory tape drive. Each 657 disk has a capacity of 50 million bytes.

The association purchased all other system hardware, including two NCR 796-301 CRT terminals (with printer attachments) for file maintenance and inquiry and 19 NCR 270 electronic teller terminals for its main office and branch offices. Fidelity also utilizes NCR's software package for the savings and loan industry.

This combination of equipment and software provides Fidelity with a variety of capabilities not previously available, including on-line access to account histories and the opportunity to automatically calculate penalties on certificates of deposit.

The ability to produce special statistical reports for management is another significant benefit. Automatic generation of an auditor's report, covering all "unusual" transactions, such as those requiring officer approval, is one example of enhanced security; the chance to word customer communications as it wishes is another, Cothorn said.

Time-saving features of the system are important, too. Using the terminals, which have the ability to write on tape, it is possible to store off-line transactions to be input automatically. The need to reenter data can be eliminated, reducing the chance for error. The upgraded equipment, especially the teller terminals, speeds customer service and simplifies new employee training, Cothorn said.

"I'm not criticizing computer service companies," he added, "But the packages they develop for groups of savings and loan users must have inherent limitations. Consider, for example, delinquent loan notices.

"If a service company has several different associations, it can't possibly individualize the notice wording for each customer. Just changing paper in the printer would present a problem.

"Can you imagine the uproar if the wrong notice were used and a 'get tough' message went out to the customers of an association which had a more lenient approach?"

Concern With Money

In deciding upon its system design, Fidelity was very concerned with teller terminals, upward compatibility, the availability of software and, of course, money.

"Many terminals we looked at require more powerful equipment to drive them," Cothorn recalled. "We felt the NCR Century offered us the power we needed to drive the terminals at an economical cost. We can also upgrade to a more powerful century computer without having to change language or software."

"Accessories can be added for electronic funds transfer and automatic teller services without scrapping our existing terminals," he noted.

The cost of software development ruled out some systems which Fidelity considered.

Further, Cothorn finds it "reassuring to know that Fidelity will have access to new software modules as they are developed." Share loans, statement savings and construction loans are examples of software needs on the horizon, he said.

Fidelity's teller terminals feature a keyboard with a CRT that provides

step-by-step instructions for handling each type of transaction. The backlit instruction panel assures that no steps are overlooked — even when a teller is handling unusual transactions. New tellers do not have to memorize complicated procedures, Cothorn explained.

Another feature of the terminals is their ability to record on cassettes. "If the system's down, a teller must enter the information in some way to record the transaction in the customer's passbook," Cothorn said. "Since the terminal has the ability to write entries onto a tape cassette, this information can be stored off-line for convenient data reentry.

"This capability can be particularly valuable for mailroom tellers who receive, batch, prove and balance about 80% of all loan payments and a large number of savings deposits. Though they don't need to immediately enter information for a customer, they must pace their work to keep up with the volume. It's a real advantage for them to be able to store information off-line," he said.

Automatic calculation of penalties on certificates of deposit is a benefit much closer at hand. To determine the penalty on an early withdrawal from a time deposit, a manager or teller has to determine the number of days the money has been on deposit, then adjust earnings back to the passbook rate. Fidelity has been using charts in its penalty procedure.

If the money has been on deposit for two years, it takes several minutes to figure, while the customer is kept waiting. When using this feature, Fidelity will be able to calculate penalties automatically. The teller will also be able to make an inquiry and tell the customer the penalty amount before processing.

In the future, on-line history and an alpha locator, or CIF file, will give Fidelity immediate access to every account a customer has with the association, using name or account numbers.

This information is currently kept on microfiche; to use fiche, however, the teller has to leave his station or turn his back on the customer. With the information on-line, it will be easier and more convenient.

Each terminal is designed to allow operation on a different key by up to four tellers. That is an important feature in the small branch offices where secretaries, branch managers, and part-time help may relieve regular tellers during vacations, lunches and breaks, according to Cothorn.

With the terminal, some transactions aren't completed without supervisor override. For example, a teller can't make a withdrawal without a passbook unless a supervisor key is used to "unlock" the terminal. Every transaction for which the key is needed automatically appears on an auditor's report.

Future requirements played a large role in Fidelity's selection of the teller terminals. The future and a trend toward a paperless society also was a key in Fidelity's decision to include a tape drive unit in its system.

"Our requirements are going to change dramatically in the coming years," he concluded. "By going in-house, we have gained the flexibility we will need."

1401 payroll blues?

The 1401 is long dead but lots of 360/370 users are still struggling with retread 1401 software.

How to spot a retread? Easy . . . a half-astute system design, 50, 60, 100 small programs, time wasting multiple read/writes, no real EEO, or ERISA capabilities . . .

If you are struggling with a retread on your 360/370, Honeywell, Burroughs or Univac, all is not lost . . . call Joe Nestor (617) 851-4111, Wang Laboratories, Inc., Lowell, MA 01851. In California, call Carl Tarascio (714) 631-0138.

WANG

MOST READERS OF COMPUTERWORLD
SHOULDN'T EVEN BOTHER WITH THIS AD

**But for
Converters or Manufacturers
of data processing and
terminal printer ribbons,
this message is a must!**

As a Manufacturer, Converter or Re-inker, you're one of a SELECT group of specialists who know that you must start with the best to produce the best. We're one of America's largest producers of top-quality reusable (multistrike) film ribbon materials for data processing and terminal printers. The Bee product is ideal for those applications where intense, sharp, long-lasting impressions are essential: management reports, consumer billing, Optical Character Recognition, computer letter writing and other special requirements. Available in 17" to 9" widths in bulk rolls, 4" to 1/2" widths in slit reels. For full data fast, mail the coupon now!

Bee Chemical Co., Office Products Division
26 Daniel Road West, Fairfield, N.J. 07006
201/863-8686

Please send facts immediately.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Honeywell's Level 6. The mini that lets you design aggressively for the future.

Honeywell's Level 6 minicomputer brings new design freedom to the OEM and systems builder.

With its fully open-ended, modular architecture and unique Megabus that lets you mix processors, memories, communications and peripherals to meet just about any system requirements.

With packaging versatility that includes table top, rack-mounted and office versions.

With modular software that's responsive to OEM needs. For example, GCOS 6/MDT, a Multi-Dimensional Tasking disk-based operating system provides a compatible interface to all language processors. You can mix or match FORTRAN, COBOL and RPG to speed applications development. And there's

full compatibility between the ISAM file system and the language processors as well.

Furthermore, GCOS 6/MDT takes full advantage of Level 6 hardware features such as automatic context save and restore, independent traps and dynamically assignable priority levels.

With our attractive OEM pricing, contracts, and policies.

And with a worldwide mainframe supplier on your team, when you need maintenance or support, you don't have to hunt for it.



Honeywell

Honeywell Information Systems
200 Smith Street (MS 487)
Waltham, MA 02154

Please send me more information on Level 6.

- I'm an OEM. Put me on your mailing list.
 I'm an end-user. I've read enough, let's talk.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

We want you to have all the facts on Level 6.

1
1
3
8

S
E
P

1
9

7
7
UMI

Report Eyes Contract Provisions

WINTER PARK, Fla. — A report outlining important user-oriented contractual provisions for an era of price cutting and new equipment introductions has been made available by International Computer Negotiations, Inc. (ICN).

These provisions are featured in ICN's *Computer Negotiations Report (CNReport)*, Issue 2.

In line with the latest round of hardware price cuts and new system introductions which have generated considerable interest in recent months, *CNReport*, Issue 2

deals with the numerous contractual provisions that are critical to the user in a price-cutting environment.

Four major contractual considerations are covered in the report:

- Guaranteeing the price — how to ensure that your organization will enjoy the benefit of any price reduction announced after you've signed the contract.
- Substitute or upgraded equipment — how to protect
- Cancellation of the order — how to get out if the price goes up or down or if new state-of-the-art equipment is announced.
- Residual guarantees — provisions to use to guarantee the future value of your system.

The report is available for \$18 from International Computer Negotiations, Inc., 400 New York Ave., Box 364, Winter Park, Fla. 32790.

yourself (via the contract) from instant obsolescence.

T/S System Drives Debut

SUNNYVALE, Calif. — Basic Timesharing, Inc. has introduced a disk drive and tape cartridge drive for its Model 4000 series interactive time-sharing systems.

The Model 4460 disk drive provides 10M bytes of non-recoverable formatted storage and replaces the 7.5M-byte drive previously incorporated in the 4000/15 system, according to a spokesman.

The Model 4560 magnetic tape cartridge drive provides 10M bytes of storage using 6,400 bit/in. recording density.

The drives are included as standard equipment on the 4000/15 system at no additional cost. A dual-drive version of the tape drive is included along with a disk drive in the 4000/25 system at no additional cost, the spokesman said from 370 W. Maude Ave., Sunnyvale, Calif. 94086.

Card Reader Has Buffer

MELBOURNE, Fla. — Documentation, Inc. has introduced a fully buffered card reader that reportedly appears as an IBM 2501 reader to IBM 360 or 370 CPUs.

The 1,000 card/min reader, the DOC 6501, is unlike the 2501 in that it is fully buffered and can be installed as a low-priority device on any position on the channel, a spokesman claimed.

The unit has a "pick and rifle" vacuum air system that the firm claims will virtually eliminate the normal card edge damage found in mechanical feed mechanisms. The unit also features data resynchronizing logic which reportedly provides accurate reading of cards with punching misregistered by more than 50% over the industry standard, the spokesman said.

The unit sells for \$14,000 from the firm at P.O. Box 1240, Melbourne, Fla. 32901.

Firm Adds Two Printer Systems

MELBOURNE, Fla. — Documentation, Inc. has expanded its family of line printer subsystems with the introduction of both a 1,250 line/min and a 1,500 line/min printer.

The DOC 1250 and DOC 1500 are microprocessor-controlled, fully buffered, 132-char. systems that are IBM 1403 plug-compatible.

Standard features include six-part form printing, interchangeable print bands, a forms control buffer, vertical line spacing of either 6 or 8 line/in. and a 75 in./sec slew rate, the spokesman said.

An integrated controller communicates through the interface to the host CPU, decodes all commands, controls printer hardware and reports both errors and status, the spokesman explained.

The DOC 1250 costs \$45,000 and the DOC 1500 sells for \$50,000 from the firm at P.O. Box 1240, Melbourne, Fla. 32901.

SERIES 700
Distributed Processing Systems

**Easy-to-use software,
built-in printer,
large screen, more memory.**



Programmable Device Records Transaction Data

PENNSAUKEN, N.J. — The Danyl Corp. here has introduced a microprocessor-controlled transaction recorder. The unit was designed for a variety of data acquisition and data logging applications, the firm said.

System 80, which features a cassette recorder and an 8080-based microprocessor controller, allows the installation of a 17-char. badge reader and 32-key calculator-style

keyboard as optional input devices, according to a spokesman.

The use of the microprocessor-based controller allows the System 80 to be programmed and tailored for specific data entry and acquisition requirements.

Input data may be checked for validity and analog data may be compared to go/no-go thresholds or may be averaged over time, the spokesman ex-

plained.

All transaction information may be recorded on tape for subsequent processing and the tape capacity exceeds 125,000 bytes, he said.

The system may be purchased without firmware for user programming and Danyl will provide programming and external interfaces per user specifications. The recorder accommodates up to 1.5K bytes of read-only

memory and 256 bytes of random-access memory, the spokesman said.

System 80 costs \$1,250 and

delivery is 60 days from the firm at N. Park Drive and Browning Road, Pennsauken, N.J. 08109.

Free Catalogs Offered

The following brochures and catalogs are available free of charge from vendors:

CW Industries, Inc. has a 12-page catalog describing the company's Cee Wee connec-

tors for flat flexible cable with round connectors. The firm can be reached at P.O. Box 96, Warminster, Pa. 18974.

A 24-page full-color brochure covering Versatec Co.'s line of printers and plotters is available from the firm at 2805 Bowers Ave., Santa Clara, Calif. 95051.

A one-sheet catalog of capabilities describing the sonic digitizers, data converters, interfaces and accessories produced by Science Accessories Corp. is available from the firm at 970 Kings Highway West, Southport, Conn. 06490.

Literature describing the processing of payments by transaction at high speed is available from Cummins-Allison Corp., Data Systems Division, 800 Waukegan Road, Glenview, Ill. 60025.

A brochure covering Tenny Engineering, Inc.'s digital instrumentation options is offered by the firm at 1090G Springfield Road, Union, N.J. 07083.

A technical bulletin from Mavilor Motors describes the firm's line of .25-through 13-horsepower DC motors. The firm is at 285 Murphy Road, Hartford, Conn. 06114.

Breadboards

A 32-page catalog describing over 100 different breadboards for use by prototyping engineers is available from Douglas Electronics, 718 Marina Blvd., San Leandro, Calif. 94577.

A 12-page brochure that provides a graphic presentation of the metal cabinetry capability of Electronic Enclosures, Inc. is available from the firm at 225 S. Aviation Blvd., El Segundo, Calif. 90245.

A 14-page, four-color brochure by Datel Systems, Inc. describes its 40-column alphanumeric impact printer. The firm is at 1020 Turnpike St., Canton, Mass. 02021.

Network Systems Corp. is offering six application data sheets featuring Hyperchannel, a product for multiple computer interconnects. The firm is at 6820 Shingle Creek Pkwy., Brooklyn Center, Minn. 55430.

An illustrated 8-page bulletin explains in management terms the problems and solutions encountered with computer systems involving power deviation, brownouts and blackouts. It is available from Cybernex, Inc., 7171 Industrial Park Blvd., Mentor, Ohio 44060.

Introducing the Model 770 Intelligent Terminal.

From the company that makes technology affordable.



TEXAS INSTRUMENTS.

The Model 770 Intelligent Terminal is a powerful system designed to meet your distributed processing needs. Better than sending your data to your host by mail or teletypewriter, better than entering it by keypunch or key-to-disk, the 770 provides the ideal, cost-effective solution for source data entry, data pre-processing and communications for your distributed processing applications.

Reduces your communications costs.

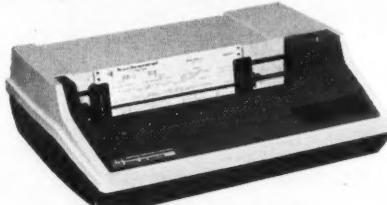
The Model 770 removes a substantial burden from your host computer and reduces your data communications costs. By pre-processing your data on the spot, errors are reduced, and speed and accuracy are increased. Additional communications savings can result by transmitting batched data at high speed during unattended operation when line rates are lower.

Totally integrated package.

The Model 770 terminal includes all the components of an entire system. It has features like dual mini-cartridge tapes, a 1920-character video display and up to 48K bytes of memory. And it's the first video display-based intelligent terminal on the market that offers

a built-in 80-column printer.

For multi-copy and 132-column capability, TI's compact, microprocessor-based Model 810 impact printer is also available.



Model 810 Impact Printer

Easy-to-use software, easy-to-learn language.

Model 770 terminals are easy to program and operate with TPL 700, the flexible, powerful Ter-

minal Programming Language. TPL 700 is a high-level business-oriented language that greatly simplifies forms generation and procedures for data entry and local processing. Programs can be developed interactively on the 770 without ever writing lines of code.

And, of course, TI offers total service and support, including flexible maintenance plans and a nationwide network of factory-trained customer service engineers. For your distributed processing needs, TI clearly has a better solution. For more information, mail back the coupon. Or call your nearest TI sales office or Terminal Systems Marketing, (512) 258-7176.



Yes! I am interested in the Model 770 Intelligent Terminal.

- Please send me more information.
- Please have your representative call me.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

My application is _____

Mail to: Texas Instruments Incorporated, P.O. Box 1444, M/S 784
Houston, Texas 77001

1-9-CW

Copyright ©1977, Texas Instruments Incorporated

TEXAS INSTRUMENTS
INCORPORATED

V
1
1
3
8

S
E
P

1
9

7
7
UMI

Inforex Hikes Disk Capacity of System 5000

BURLINGTON, Mass. — Inforex, Inc. has reportedly quadrupled the disk storage capacity of its System 5000 file management system with the introduction of two dual-density disk storage units.

The Inforex offerings are the 62.1M-byte Model 5303 and the 236.1M-byte Model 5304. Up to four drives of either density can be attached to each System 5000 control unit, providing a maximum capacity of 944M bytes rather than the previous limit of 200M bytes, according to a spokesman.

The Model 5303 features 256 byte-sector, 59 sector/track and 5 track/cylinder. Each pack contains 823 cylinders and five platters. All five platters can be multitrack searched, he said.

The units have a rotational speed of 16.67 msec with 8.33 sec of latency; the unit achieves 3,600 rev/min, he added.

The drive supports 4,040 tracks/pack on the initial drive and hosts up to four drives, allowing a total of 16,385 maximum usable tracks.

Extra Drives Optional

A 5303 drive with controller sells for \$40,000. A controller can handle four drives and an additional drive sells for \$27,000. Monthly rentals on the drive and controller range from \$960- to \$1,370/mo. Rentals on the additional drive range from \$630 - to \$830/mo.

The Model 5304 drive features 256 byte/sector, 59 sector/track and 19 track/cylinder. Each pack contains 823

cylinders and 10 platters.

Eight of the platters can be multitrack searched. Rotational speed, latency and rev/min rates are the same as those of the 5303.

The drive supports 15,562 track/pack on the initial drive and hosts up to four drives, allowing a total of 62,473 usable tracks, the spokesman

said.

The 5304 with controller sells for \$80,000 and a second drive sells for \$42,000. Monthly rentals range from \$1,835- to \$2,160/mo for a single-drive unit to \$940- to \$1,230/mo for the second drive.

Inforex is at 21 North Ave., Burlington, Mass. 01830.

IBM Microfilmer Enhances Deposit Processing System

WHITE PLAINS, N.Y. — IBM Corp. has introduced a microfilm recorder that gives banks a sequenced tally of checks and deposit slips that have been processed by the firm's 3895 deposit processing system.

The unit records documents as they move through the 3895 reader-inscriber, making pictures of one or both sides of each document, a spokesman explained. The unit can record more than 100,000 items daily, he said.

Eight-digit index numbers are printed on the microfilm next to document images for retrieval of specific items. The numbers match those the 3895 prints on the face of each item, permitting stored documents to be matched with the film record, the spokesman said.

Additional item-tracking capability is provided by frame marks exposed along the film edge.

The recorder, which can be field-installed, fits into a 4-ft wide section of the 3895. The accessory film cassette

can store approximately 380,000 front and back images on 2,000 linear ft of microfilm, the spokesman noted.

Software Support

The on-line microfilming feature will be supported by application software, the Check Processing Control System/Deposit Processing Feature and by Deposit Processing-Operating System/Virtual Storage (OS/VS).

The monthly lease charge for the feature is \$2,725; monthly use charge is 1.9 cents per 100 item passes. Purchase price is \$100,000 and the price of the film cassette is \$424.

First shipments will be scheduled for November 1978, the spokesman said from 1133 Westchester Ave., White Plains, N.Y. 10604.

YOUR OFFICE IS WAITING!

The solution for a fully staffed, furnished, luxurious office with a prominent address, eliminating capital investment, and long leases. Monthly programs from \$150 to \$650.

ATLANTA OFFICES: Downtown-Peachtree Center and Suburban-Powers Ferry Landing/(404) 955-1040

CHICAGO OFFICES: on North Michigan Ave. at Ontario St./[312] 751-2700

HOUSTON OFFICES: Downtown-Allen Center and Suburban-One Woodway Dr./[713] 965-0060

NEW YORK OFFICES: the Chanin Building at Grand Central Station/[212] 867-5750

OR WRITE FOR BROCHURE: Jewell Taylor, Omni Offices, Inc./10th Floor/One Allen Center/Houston, Texas/77002

* CONFERENCE ROOMS • TELEX • TWX • OFFICE STAFF • RECEPTIONISTS

Film Puts Stop To Data Problem

(Continued from Page 51)
trols the distance from which the information can be seen. Someone six feet away, for example, sees only a blank screen.

The screens are now in place in 440 branches, and the bank expects to have more than 900 branches on the system equipped with the light control film by 1980, Tompkins noted.

More Than a Service

Maintaining the confidentiality of customer records is more than a service, it's a basic principle of banking, he said. "Fortunately, we were able to correct a potentially damaging situation before it went too far. Had we done nothing at the time and looked the other way, I'm certain there'd be action by now in many quarters."

"The potential ramifications of doing nothing far outweigh what it has cost us," he added.

It took less than five minutes to install the sheets of film and conversion has posed no problems, except for the occasional human error, Tompkins said.

"When we started the test, one of the employees in the corporate data center indicated that nothing could be read through the new film," he recalled. "The employee said that the screens were not at all what was ordered and they didn't work."

"I told the employee to bring them over and we'd take a look at them here. They worked fine. They had been installed upside down."

MORE BPS From . . .

OMNI-TEX

"Solve Your Time-Sharing Data Rate Problems With Our 'Switchable' 103/202 Acoustic Coupler!"

There's nothing like it available! Now you can switch instantly between 103 and 202 protocols and get data rates from 300-1500 baud — all in one compact programmable coupler package! Why settle for less? Call Collect (602) 252-2083 or write Dept. 822.

OMNITEC DATA
"New Dimensions In Modems"
2405 South 20th Street • Phoenix, Arizona 85034

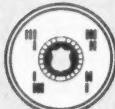
COMPUTER DISASTER.

95% of the computer contingency/recovery plans surveyed failed to work.

Would yours?

This startling fact has been revealed again and again in our review of the computer emergency recovery plans of many of the nation's top corporations. In our role as an independent computer security consulting firm for over 250 major companies, we have also found that only a few have even undertaken a formal risk analysis survey.

Considering what's at stake, perhaps you'd like to know more about our services. They include risk analysis, data security, physical protection, emergency/recovery plans, theft and fraud control as well as facility design. For more information contact: J. C. Matlock, Jr. Dept. C, 235 Northeast Loop 820, Hurst, Texas 76053, (817) 589-2244.



DATA PROCESSING SECURITY, INC.

New York Chicago Los Angeles Dallas/Fort Worth

Survey Shows Users Happy With Minis

By Esther Surden
CW Staff

Most minicomputer users who responded to CW's recent survey were very pleased with their small systems despite problems with software support [CW, Aug. 29].

Those who responded were dedicated to using the small systems. For example, when asked what their firms will do when they outgrow their present mini, most users said the companies will either get a larger mini or off-load the small system with another small system. Few believed they will ever outgrow their present system.

Adding memory, disks or terminals to the present system was a growth alternative often cited. Only a few users said they would grow into a mainframe when their processing needs become too complex for their present mini.

Outgrowing the system "is not foreseeable at the present time," one user told CW, while another said "it cannot happen."

Upgrade Capability

System upgradability was a topic touched upon often by users explaining why they switched from one system to another or why they liked their particular mini.

One company that was happy with its Hewlett-Packard 2100 system converted to a Prime Computer, Inc. 400 minicomputer. "The reason we did not stay with HP is that it is not easy to upgrade in small steps. With Prime, we can gradually upgrade as (and how) we need it with no software modifications," the DP manager said.

Another user, explaining why his company will get another supermini if it ever outgrows the one it owns, said: "Two superminis are better than one large mainframe. Also [this] helps cash flow [because] you buy it when/as you become ready."

The price/performance benefits of minis were touted by many users. "Transaction-oriented minis are great. They give users control of their systems and the price/performance is outstanding," in the opinion of one systems manager.

A Los Angeles company using Digital Equipment Corp., Qantel Corp., Data General Corp. and IBM minis said, "generally, price/performance ratio and type of applications are superior for minis."

Minis bring processing power closer to the user, several respondents pointed out. "The trend toward minis will continue as large systems remain unmanageably complex," a user of a mainframe who also copes with 50 minis predicted. "Using a mini allows local users access to data and fast turnaround," a DP manager said.

System Sniffs Out Savings

By Esther Surden
CW Staff

NEW YORK — "Our inventory made up our largest investment, so we thought we'd better go after our bread and butter application first," William Bulger, treasurer of Fritzsche, Dodge and Olcott, Inc., said.

The firm's system has been credited with cutting response to inventory inquiries from three days to 10 seconds and reducing the disparity between physical inventory and recorded inventory from 7% to 1%.

The firm is using an IBM 3/15 small business system to keep track of more than 4,000 off-the-shelf products, 3,000 special orders and more than 180,000 formulas for the flavors, fragrances and oils it produces.

Prior to the company's first move to a computer, an IBM 1401, the inventory was kept on receiving and withdrawal slips for each product and each lot of the product. The slips were kept in a file cabinet clipped to "long skinny plates." When a withdrawal was made from a particular product supply and lot, a withdrawal slip was added to the file and the balance left was forwarded, Bulger said.

Files Unwieldy

The business grew to the point where the file cabinet became a cumbersome way to do business. In addition, "the company's needs were getting more sophisticated" and government regulations



Inventory system at Fritzsche Dodge and Olcott, Inc. copes with materials for 180,000 flavor and fragrance formulas.

tions more complicated.

"If the Federal Drug Administration, for example, banned certain chemicals, we would have to find which products in the line used those chemicals in order to revise the formulas" or else withdraw the product, he continued.

The 1401 performed the inventory application using cards "but it was still too slow." Teletypes at the company's remote locations in New Jersey transmitted inventory data daily, so the records at company headquarters were only behind by a day and a half, rather than three days.

Anticipating a move to an on-line system, the firm then installed an IBM 360 which

emulated the 1401, because it was "easier to go from a 360 to a 3," Bulger said. This allowed the company to keep in business while the programs were being changed to on-line status.

The present IBM 3/15 is attached to six remote terminals in the firm's manufacturing facilities. The terminals are directly on-line to the 3/15 and data is entered at the remote locations. The firm recently installed two additional terminals for inventory and stock maintenance.

"When we used to take physical inventory we were happy with a 7% or less disparity between our figures and inventory. With this system, there is less than a 1% difference," he said.

Using Effectiveness Grid — Part 1

Method Aids Firms Nearing DDP

By Carl Masi

Special to CW

We recommend that users evaluate their needs in selecting small systems for distributed processing based upon an analysis of what we call an effectiveness grid. In fact, the larger and more diversified the company, the more important this effectiveness grid becomes.

The purpose of the grid is straightforward. It is designed to help a user measure the utility (of

This is the first part of a two-part series on using an effectiveness grid to determine distributed systems requirements. The second part will cover organizational enrichment, policy impact and measuring productivity of such a system.

a product) to his organization vs. the commitments and risks it faces (by choosing a particular piece of equipment).

There are six relevant issues not usually considered by users in their development of dispersed information systems.

First, we have the issue of functional range: the extent to which a single product or product type can fulfill all of the most commonly needed functions in the

data entry	batch processing	electronic filing	office graphics	transaction processing	word processing	PRODUCT
■	■	■	■	■	■	data entry
■	■	■	■	■	■	remote batch
■	■	■	■	■	■	intelligent terminals
■	■	■	■	■	■	minicomputers
■	■	■	■	■	■	network systems
■	■	■	■	■	■	small business computers

■ = very effective
 ▨ = somewhat effective
 □ = unable to perform

An example of a functional range effectiveness grid.

departments, offices and other locations that the user might wish to incorporate in a distributed network.

Essentially, data entry, electronic filing, transaction processing, batch processing, office graphics and word processing are all of the functions that one is likely to have occasion to perform in a distributed network, now or in the future.

The available classes of products with which to perform those functions are data entry systems, remote batch terminals, intelligent terminals, minicomputers, networked systems and small

business computers.

Any or all of these products can be clustered or stand-alone, on-line or off-line, or available in any one of a number of configurations. What is important to measure is the extent to which each class can perform the maximum number of planned and anticipated functions in the network, not through massive customized development, which is costly to initiate and even more costly to maintain, but as standard off-the-shelf product capability.

The second major issue to be (Continued on Page 58)

INVENTORY REPORT

V
1
1
3
8

S
E
P

1
9

7
7
UMI

Industrial Process Controller

SANTA CLARA, Calif. — Selanar Corp.'s MC-1 process controller is designed to handle large industrial control and data acquisition projects, the firm said.

The MC-1 was designed to operate in a variety of industrial applications including industrial equipment monitoring, power demand regulation, chemical and petroleum process control and scientific experimentation control.

The UCP operating system aids engineering firms and end users who cannot afford to develop extensive software capabilities, the vendor claimed.

A user enters simple statements and the compiler composes the control programs using appropriate translation for each statement, the

firm explained.

The MC-1 controller consists of a 16K-word CPU, 1,920-char. CRT terminal, 30 char./sec matrix printer, IBM-compatible diskette storage system and a 64-channel analog measurement device.

A custom digital I/O interface includes 256 inputs and 128 outputs with a basic scan rate of 10 times per second per channel under program control. The interface also has two serial I/O ports for the CRT and printer. An 8-bit parallel interface is also part of the package.

The package costs \$26,000 including on-site setup and test plus software instruction. Selanar is located at 3054 Lawrence Expressway, Santa Clara, Calif. 95051.

Video Unit Fits DG Minis

BURLINGTON, Mass. — The Model 200-D Graphics and Imaging Video Processor from Lexidata Corp. generates raster-scanned, refresh, graphics and imaging displays, according to the firm.

The unit is contained on a 15 in. by 15 in. printed circuit board and fits into "any standard Data General Corp. Nova or Eclipse," the firm noted.

A standard upper case Ascii alphanumeric character generator produces 5 by 7 dot matrix characters

which may be superimposed on the image displayed.

Featuring a writable control store, the Model 200-D allows modification of all image-processing and data-formatting routines under program control from the host system, the company said.

Model 200-D costs \$4,900 for a basic black and white model and \$5,300 for the basic color version, Lexidata said from 215 Middlesex Twp., Burlington, Mass. 01830.

Grid Aids DDP Selection

(Continued from Page 57)

faced in terms of distributed processing is transitional ease — the ease with which the user can take the cur-

rent system and planned new products and integrate them into the dynamics and geography of the business. This integration must be accomplished in six ways — selecting and preparing sites, training the staff, converting and developing software, insuring compatibility with existing systems if needed, implementing procedural changes and ensuring adaptability to both initial and longer term requirements of the business.

Using the grid it becomes clear that some products are much easier to install painlessly than others. Some will require substantial software development and conversion. Others, by their nature, have limited future growth potential. And some will require heavy training commitments.

To many users, one or more of these limitations may be unimportant, since they are planning major changes for which training or conversion efforts should be heavy. But the point of this grid evaluation is to anticipate and clarify in advance and with precision the extent of such requirements.

The third major issue in distributed processing development is the configurability of the various product classes, both now and in the future. If the organization is changing constantly, the requirement for equipment to keep up with that change is of paramount importance.

System Expandability

Therefore, when we talk of configurability, we are talking about the ease with which product classes can be reshaped, when and as needed from single stand-alone devices to small, medium or large clusters; or expanded to become multiprocessing systems, if such is required; or through minor software modification made to perform in concurrent or multiprogramming modes.

Another key aspect of configuring a network of small systems is mobility, the ease with which Product A, no longer needed in Location B, can be packed up and moved to Site C.

Peripherals Important

So also is the peripheral equipment complement important. The 15 char./sec printer in use today at a specific site will probably have to grow to 45 char./sec or 60 line/min before long. It may have to have some disk storage as well. Thus it is very important to rate product classes on their effectiveness in terms of configurability.

This article was excerpted from a speech delivered by Masi, director of product marketing for Wang Laboratories, Inc., Lowell, Mass., at a recent conference.

Sooner or later your management is going to ask you for a casualty risk and insurance information system, so...you should know about

**corporate
systems**

a company devoted exclusively to Risk and Insurance Information

Our only business is helping corporations, governments and institutions control the mushrooming cost of accidental loss. Information is essential to reducing these costs. Our system provides your insurance department and/or top management with monthly or quarterly reports covering any or all of these things:

- total risk cost—insured, self-insured and non-insured
- the how and why of all losses
- allocation of cost-of-risk to corporate subdivisions based on experience as well as exposure (forecast premium allocation with retrospective adjustments)
- monitor claim reserves or determine an IBNR for self-insurance
- accurately allocate property premiums
- show how risk and risk management is affecting the corporate P & L

We can have a system operating for your company sooner than you could complete a feasibility study—and for less money than your feasibility study would cost. Ten years of actual use eliminates the months of testing of a do-it-yourself program.

We've got lots of good references. We're now providing this service to hundreds of major corporations, governmental entities and institutions. When you get the call...give us a call. Whether or not you're interested in our service, we can help you understand the problem and point you toward a solution.



**corporate
systems**

P. O. Box 2827, Amarillo, Texas 79105
(806) 376-4223 (800) 858-4160 (toll free outside of Texas)

Also: Corporate Systems Australia, 492 St. Kilda Road, Melbourne, Australia

Dual Minis Offer Process Control

PRINCETON, N.J. — A minicomputer-based process control system that uses dual Modular Computer Systems, Inc. 32-bit CPUs is available from Metromation, Inc.

The system was designed to "meet information and control requirements for large refineries, gas pipeline systems and petrochemical plant complexes," Metromation said. Typical applications include data gathering, monitoring of utility services and control of unit operations, it added.

The CPUs share data loads by "functional splitting" rather than having a redundant CPU on stand-by, a spokeswoman explained. The first CPU handles real-time functions while the second handles interactive/batch operations.

Controller Fits Nova, DCC-116

PALISADES PARK, N.J. — A peripheral controller for Data General Corp. Nova 1200 and Digital Computer Controls, Inc. DCC-116 minicomputers that reportedly can replace up to five DG controller boards is available from Computer Data Access, Inc. (CDA).

The Model 6100 controller provides all controllers needed for a small online, multiterminal computer system. It can handle up to four California Computer Products, Inc. 140 series floppy disk drives, up to three RS-232 devices and a line printer, the firm noted.

The unit costs \$2,200 with quantity discounts available, a spokesman noted from CDA at 470 Commercial Ave., Palisades Park, N.J. 07650.

IDS Introduces Impact Printer

WATERTOWN, Mass. — A tabletop dot matrix impact printer designed for use with minicomputers and microcomputers is available from Integral Data Systems, Inc. (IDS).

The printer operates at up to 120 char./sec and accommodates up to 132 char./line, IDS said. An RS-232 and current-loop serial interface are standard.

Other features include enhanced mode double-width characters, selectable character and line sizes and multiple copy capability on both fanfold and roll paper.

A 5 by 7 dot matrix is used to print the standard 64-character ASCII set, the company noted.

The unit costs \$745 from IDS at 5 Bridge St., Watertown, Mass. 02172.

3M Offers Cartridge For HP 7905 Drive

ST. PAUL, Minn. — A front-loading, single-disk cartridge for the Hewlett-Packard Co. 7905 disk cartridge drive is available from 3M Co.

The Scotch Brand 932 disk cartridge features a 200 track/in. track density and a bit density of 4,400 bit/in. It has a capacity of 10M bytes per cartridge, the firm noted.

The disk costs \$150 to \$160, depending on quantity, from 3M at Department DR7-6, 3M Center, St. Paul, Minn. 55133.

Either CPU can take over the operations by dual addressing of key peripherals, redundant data recording techniques and inter-CPU communications techniques, the firm noted.

Prices for the system range from \$500,000 to \$2 million and are dependent on the individual user's requirements, the spokeswoman stated. The company can be reached at 1100 State Road, Princeton, N.J. 08540.

Memory Replaces DEC Disk

ENGLEWOOD, Colo. — A solid-state replacement memory unit for the Digital Equipment Corp. RF/RS-11 fixed-head disk is available from Monolithic Systems Corp.

Dubbed the Extended Memory Unit, (EMU), the device features an access time of 2.1 microsec, required to set up control registers and initiate the transfer of information to and from the

main memory, Monolithic said.

The unit can be used in DEC PDP-11/04 to 11/70 systems.

Using interchangeable memory modules, the unit features a dual-port Unibus interface, the vendor said.

The EMU costs \$23,795 for one million bytes. Monolithic is located at 14 Inverness Drive East, Englewood, Colo. 80110.

Micro Debuts

LA JOLLA, Calif. — The Micro-740 from Micro Business Applications, Inc. is a small business system based on a microcomputer.

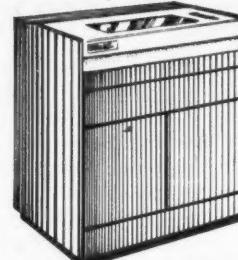
The basic system, configured around an Intel 8020 microprocessor, includes 58K bytes of user-accessible memory; one CRT; a 6M-byte fixed platter disk drive; cartridge tape drive capable of handling 2.4M- to 11.2M bytes of data depending on how it is formatted; a 125 line/min printer.

The basic system, available next month, will cost \$24,750. The Fortran compiler will cost \$1,000. The company can be reached through P.O. Box 2888, La Jolla, Calif. 92038.



Digital Associates Corporation

Or, switch to chain-train quality.



The DAC CT 6644 is a 600 LPM chain-train printer that replaces LP11-YA.

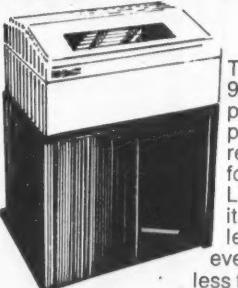
It gives letter-quality printing, and costs about 40% less than DEC's 600 LPM drum printer.

Again it comes with PDP-11 interface, installation and maintenance.

Specification:

Solid-font chain-train printer
600 LPM, 132 column/line
64 character/column
Available in u/l case

Or, upgrade to a 900 LPM printer for 25% less than you now pay for 600 LPM.

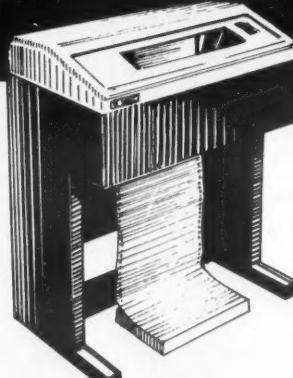


The DAC 2290 900 LPM printer is a plug-to-plug replacement for the LP11-CA. But it costs 30% less. In fact, it even costs 25% less than DEC's 600 LPM printer. Comes with PDP-11 interface, installation and maintenance.

Specification:

Solid-font drum printer
900 LPM, 136 column/line
64 character/column

PDP-11 USERS: Save 40% on your LP11-YA printer costs.



Replace your LP11-YA with our DAC 2260

The DAC-2260 is a 600 LPM, plug-to-plug replacement for your LP11-YA. It comes with PDP-11 interface, installation and complete maintenance service. Buy, rent, or lease. The saving is 40%.

Specification:

Solid-font drum printer
600 LPM, 136 column/line
64 character/column

Why we can offer such extraordinary savings.

The Digital Associates Printer Store is the largest independent outlet of quality line printers for mini-computer systems.

We buy printers, in quantity, directly from the manufacturers, and add interfaces to all the popular mini-computer CPU's. Then we offer complete printer systems (printer interface, installation and service) at prices the mini-computer suppliers simply can't match. The Printer Store can supply printers from 100 to 1500 LPM, dot matrix, drum, chain train or band technology, for DEC, Data General, Hewlett-Packard, Interdata, G.A. and most other mini-computer systems! And for IBM Series 1 and S/3 computers. We install what we sell, and service what we install (unless you insist on doing it yourself). Buy, lease or rent, you'll save 20% to 50% on prices you'd pay to the mini-computer manufacturer.

Have you ordered a DEC-20?

Before you sign up for an LP-20 printer, call The Printer Store. We'll give you a wider choice of printers with substantial savings on any type you choose.

Digital Associates Corporation
1039 E. Main Street
Stamford, Connecticut 06902

I'd like more information on The Printer Store

Send literature on following printer _____

Name _____

Company _____ Title _____

Address _____

City _____ State _____ Zip _____

Phone _____

PDP-11 Changes Eased

WOODLAND HILLS, Calif. — A device designed to let Digital Equipment Corp. PDP-11 minicomputer users physically and electrically reconfigure their systems is available from Datafusion Corp.

Called the OSR11-A Busrouter, the unit can aid users who, for example, have "too many peripherals for a single CPU, causing the Unibus to be overloaded," a spokesman explained.

The Busrouter can have up to eight switching planes in its housing, the company said. The Unibus plugs into one of the switching planes and comes out as two cables on the other side of the box, a spokesman explained.

Two different sets of peripherals can then be attached to the cables. A user could run for four hours with one set, for example, and then switch to the other set for the rest of the processing.

A number of different configurations can be accommodated involving multiple CPUs, the spokesman added.

A single-plane version of the product costs \$995. The systems are delivered configured to the user's particular application with delivery available in "about three weeks," the spokesman continued. Datafusion Corp. is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.



CALL US

**Greyhound Computer Corporation
Available Immediately for Short-Term
Lease**

370/138, 370/148, 370/145

3330's and OEM 3330's

360/30, 360/40, 360/50, 360/65's

Greyhound Phoenix ICA's

U.S.	Boston Chicago San Francisco	Tom Ryan Jerry Smith Dave Hyland	(617) 272-8110 (312) 298-3910 (415) 283-8980
International	Canada Mexico Eurasia (U.S. inquiries) U.K./Europe Austro-Asia	Don Mauder (Toronto) Andres Contreras Don Haworth (Dallas) Joe Gold (Geneva) John Hallmark (Dallas)	(416) 366-1513 (905) 543-6850 (214) 233-1818 (022) 61-27-54 (214) 233-1818
Non-IBM:	UNIVAC or CDC only)	John Hallmark (Dallas) Don Haworth (Dallas)	(214) 233-1818 (214) 233-1818
	Greyhound Computer Corporation	Greyhound Tower Phoenix, Arizona 85077	

**UNIX
SUPPORTED
at last**

UNIX for time sharing
UNIX for programming
UNIX for text processing
UNIX for typesetting
complete
UNIX systems and services

by

Interactive Systems Corporation

Peter G. Weiner, President

1526 Cloverfield Blvd., Santa Monica, CA. 90404 (213) 829-7741

©1977 Interactive Systems Corporation

Mini Controls Library Circulation

CINCINNATI — A mini-computer-based book circulation and control system is available from Cincinnati Electronics Corp. here.

Called Classic for Circulation Library Automated System for Inventory Control, the system can be supplied as a complete turnkey unit, a spokesman noted.

The system operates without the need for a trained computer operator, the company stated.

Hardware for the unit includes the CPU, a Univac V77 (formerly from Varian Data Systems) with a minimum of 64K of memory. Also included are a printer ranging in speed from 180 char./sec to 1,200 line/min, a single magnetic tape unit for backup and one disk or multiple disks with up to 600M bytes of storage.

Terminals include a JRL-1000 circulation terminal with a built-in bar code reader and a 45 char./sec receive-only printer.

Supplied with all peripherals, terminals and software, the system ranges in price

from \$100,000 to \$300,000 depending on the library. The system is multiprogrammable so users can run other applications on it, a spokesman noted from the company at 2630 Glendale Milford Road, Cincinnati, Ohio 45241.

Decitek Adds Reader

WORCESTER, Mass. — A paper tape reader that can be configured for desktop or rack mounting with or without fanfold bins is available from Decitek.

The Model 262D9 reads at up to 300 char./sec bidirectionally and synchronously or asynchronously, according to the vendor. Standard features include an RS-232C connection, current loop and parallel

I/O interfacing. Transmission rates for the unit are selectable up to 9,600 bit/sec.

Interface characteristics are also selectable by a switch mounted on the rear panel. Additional program functions are internally programmable by jumpers, the company noted.

The unit costs \$675. Decitek is located at 250 Chandler St., Worcester, Mass. 01602.

COM Recorder Handles Color

MINNEAPOLIS — A computer output microfilm (COM) graphics-recorder that operates with Digital Equipment Corp.'s PDP-11 family running under RT-11 or RSX-11 is available from Dicom Corp.

The system was designed to satisfy both black and white and color scientific and busi-

ness graphics needs, the firm said. It is available in either on-line or off-line system configurations and produces black and white and color vector or raster images on 16mm, 35mm, 70mm and 105mm film.

A software package provides for job and recorder control, software character generation,

color control and microfiche camera control.

The base price of the D48 is \$99,750. Ten optical assemblies ranging from \$3,750 to \$24,750 are also available.

Off-line systems begin at about \$200,000, a spokesman said from the company at 9700 Newton Ave. South, Minneapolis, Minn. 55431.

Stein Has Array Processor

WALTHAM, Mass. — Stein Associates, Inc. has introduced an array processor designed for use as a number cruncher along with minicomputers.

The AR-10 has a multi-processor design. Subprocessors operate in parallel and are interconnected by the system's bus, which performs direct memory access transfers without cycle stealing.

The unit also features a cross-assembler and linker written in Ansi Fortran, he said.

The unit has an AR/Scan panel that allows operational analysis and program debugging by trapping and displaying data, addresses or other

program parameters in any of the subprocessors while the program operates at full speed, the company added.

A single subprocessor configuration costs \$28,000 and a three-processor configuration costs \$100,000. Stein is at 280 Bear Hill Road, Waltham, Mass. 02154.

RENT OR BUY

- 33, 43 Teletypes
- TI 745
- DECwriters LA36

IMMEDIATE DELIVERY

DATA COMMUNICATION EQUIPMENT BROKERS, INC.
4915 Fernlee
Royal Oak, Mich. 48073
(313) 549-3400



USE FATS TO CLEAN UP YOUR TAPE LIBRARY

FATS will eliminate costly error recovery and wasted computer time due to poor quality tapes.

FATS gives you the information you need to know.

- Location of the error
- Length of all errors
- Total number of retries for each tape.

A detailed report shows which tapes should be:
...cleaned...discarded...stripped

Call or write today for your 30 day trial and compare FATS to your OFFLINE HARDWARE EVALUATOR or reports generated by SMF and EREP.

"Makers of FDR and DSF"

**INNOVATION
DATA PROCESSING**

970 Clifton Avenue, Clifton, NJ 07013 • (201) 777-1940

NEW YORK — Olivetti has enhanced its A-6 and A-7 small business systems with the addition of floppy disk subsystem. The subsystem, which can also be used with the firm's TC800 terminal, is said to be compatible with IBM 3740 floppy disks. The floppy unit is made up of an automatic loader, dual read/write floppy disk unit and a power supply. The unit costs \$4,560 from Olivetti at 500 Park Ave., New York, N.Y. 10022.

'Typical' One a Professional Hald: Hobbyists Come in Three Varieties

By Frank Vaughan

CW Staff

ATLANTIC CITY, N.J. — Much attention has been given to the hobbyist use, but little has been done to find out exactly who that user is. The hobbyist user can actually be divided into three categories, according to Alan P. Hald.

Hald is in a good position to know about hobbyist users because he is a co-owner of the Phoenix Group, Inc. The Phoenix Group owns the Byte Shops of Arizona, Byte Shop mail order organization and Micro Age, which specializes in wholesale and special retail sales.

The first category is the pure hobbyist, according to Hald. This person wants to build the microcomputer from the bare boards up.

The second and commonest type of hobbyist is interested in a kit-type system that requires a fair degree of time and effort, but has much of the complex assembly already done.

The third category is the casual hobbyist who is interested in

either a kit or assembled mainframe and is willing to purchase assembled memory, CRTs and other peripherals.

The typical hobbyist — if there is such a creature — is usually a professional in a field that is oriented toward technology, according to Hald. Another way to describe this person would be as a "forward-looking professional," he said.

It is not uncommon for this person to have a goal of eventually integrating hobby and profession, he noted.

This integration of hobby and profession can come when a person is, for example, a writer who uses a system for text editing or a businessman who uses a system for computational tasks. Hald knows one architect who uses his hobby system for doing his contract bidding.

People want to get involved with microcomputing as a hobby, he said, but they also are looking for some long-range applications, like the retired person he knows who is working to develop a system to help the blind

interact with a CPU.

The hobbyist is generally buying an integrated system consisting of a microprocessor unit (MPU) with about 8K bytes of memory, Hald said, but it is not unusual to find some systems with a standard of 16K to 24K bytes of memory. The systems are initially tape-oriented, but now people are getting floppy disk systems.

This increase in the number of floppy disk systems is driving the average investment in a microcomputing system up from the \$1,500 to \$3,000 range to the \$4,000 to \$6,000 range. The higher investments are not uncommon, especially since the price of CRTs is coming down and they are easily within the reach of the hobbyist.

Most of the hobbyists are still involved with 8-bit machines, Hald said. The 8080 is still king, but the Z80 is "hot on its tail."

Some 16-bit machines are emerging as the systems for small businesses that require greater capabilities, such as some form of mass storage and access to es-

tablished software.

Each of the different categories of hobbyists is approaching the problem of system cost in a different manner, Hald noted. Prices are a main concern for the pure hobbyist, who is able to keep costs to bare bottom by building most or all of the system, often just for the joy of building.

The hobbyist who would like to build a kit doesn't consider cost a critical factor. The purchase of a system for this user doesn't have to be cost-justified because it is purely for personal use.

The casual hobbyist, on the other hand, is often interested in a micro only if it can do a certain job and if it is somehow cost-justified.

All three types of hobbyists are going to be quite dependent upon the retail store, which will fall in two categories, he said.

The systems store will be the main place for the hobbyist, he predicted, noting that the user will be able to find everything from the smallest micro up to small minicomputers.

Turnkey Based on 8080

PALO ALTO, Calif. — Promedics Data Corp. has introduced a turnkey microcomputer system for accounting applications in medical offices that incorporate a hobby microcomputer and standard peripherals.

The PAC 1 is an 8080-based system that uses the S-100 bus design and incorporates dual Shugart Associates floppy disk drives, a Digital Equipment Corp. LA-36 hard-copy printer and a Perkin-Elmer Fox CRT. The turnkey system uses Promedics applications software.

The system allows a doctor or small clinic to establish uniform accounting procedures for patient ledgers and gives random access to patient information seconds after the account is keyed in, according to a spokesman. A special report generator allows each end user to configure individual reports using any information stored in the patient data base, he added.

The current PAC 1 uses two 16K dynamic memory boards, a dual serial I/O board and either a Z80 or 8080 MPU card. An additional disk interface card is also housed in the system, he said.

Controller Gets Basic I/O Driver

VAN NUYS, Calif. — Roche Systems has enhanced its multicassette controller with an I/O driver for Basic, the firm said. Basic programs can now read records from cassette tape and write records to cassette tape under program control, a spokesman explained.

The I/O driver is accessed from Basic and handles all I/O to either the cassette operating system or to the console. The cassette operating system opens and closes files.

When a logical record is written, the blanks are compressed out and the record is stored in a buffer. When the buffer is filled, the physical record is written into the cassette, the spokesman said.

Each read from the cassette brings 256 bytes into the input buffer. Blanks are added

complementing the hardware is a disk operating system and language compiler/interpreter that generates pseudo operating code which can be run independently from the source code.

The disk operating system takes up approximately 20K bytes of memory, leaving 12K for application and data, the spokesman noted. Larger programs can be implemented by either adding more memory or using the operating system's overlay capabilities, he claimed.

Found Reliable

Promedics has found the hobby-type computer mainframe to be reliable and cost-effective when built and tested to commercial standards, he said. The firm is committed to microcomputers and believes "hobby computers are here to stay if they can be used for practical DP applications and achieve a price/performance ratio lower than their competition," he stated.

A PAC 1 system costs \$13,500, which includes operator training and support for one year. Promedics is at Suite 210A, 560 San Antonio Road, Palo Alto, Calif. 94306.

back into the logical records and they are passed on to the program for processing one record at a time, he noted.

The multicassette controller, which plugs into an interface board, comes in two models, a 4-port kit that costs \$140 and a 2-port kit priced at \$110.

Software included consists of the cassette operating system, Basic I/O driver and listing, assembler with patches to assemble large programs from tape, demo Basic program and demo record file.

Optional application software is available for such functions as text editing, formatting, sorting and merging, the spokesman said from the vendor at 7101 Mammoth Ave., Van Nuys, Calif. 91405.

Line Tamers Regulate Voltages

ADDISON, Ill. — Shape Magnetronics, Inc. has expanded its line of constant voltage transformers by adding the LT-2 series of Line Tamers.

The LT-2 series units have low harmonic content and can be used to prevent memory loss and operating errors caused by line noise, spikes and transients, the firm claimed.

The series will produce regulated output voltages of 120Vac or 120- and 240Vac. Output will vary less than 3V RMS from nominal for total input variations up to 35V RMS for the 120V transformers, Shape said.

Volt-ampere ratings of the transformers range from 500VA to 7,500VA, and all transformers rated at 2,000VA and below are provided with output receptacles, an on/off switch, line cord and indicator light.

The units are designed for 60Hz operation. Prices range from \$212.50 to \$1,335, a spokeswoman said from 815 Kay St., Addison, Ill. 60101.

8080 Can Use PDP-8 Software

SAG HARBOR, N.Y. — The Amide Corp. here has introduced a simulator that allows 8080 users to utilize Digital Equipment Corp. PDP-8 programs.

The software is available in two formats, Intel paper tape and Intel Tarbell cassette, according to a spokesman. It comes with a user's manual, PDP-8 programming tutorial, PDP-8 loader, Decus library information and a source listing of the I/O routines.

The paper tape version costs \$20 and the Tarbell cassette costs \$23 from the firm at P.O. Box 600, Sag Harbor, N.Y. 11963.

MICROCOMPUTING

SEPTEMBER 1977

77

UMI

MICROCOMPUTER ADS

Where to find bargains,
buyers, programs,
peripherals or personals.

Gigantic Microcomputing Catalog provides information — Microcomputers, books, economical used peripherals, \$1.00. COMPUTER WAREHOUSE, Dept.CW, 584 Commonwealth Ave., Boston, Mass. 02215.

Microcomputer Software Wanted. Complete RJE software to create 8080 based line printer, card reader, terminal compatible with IBM HASP. Box M001, 797 Washington St., Newton, Mass. 02160.

DEC PDP11VO3 40K Bytes Dual Floppies Fortran or Basic VT52 or LA36 \$12,725 or \$293 per month 5 year lease.

OPPORTUNITY FOR BUSINESS MICROCOMPUTER DEALERSHIPS. Write or call us if you are interested in being a dealer for a complete micro stand-alone business system. We have developed CPA approved business packages in application modules. Free programming support to customers and complete leasing and maintenance plans available. California Microcomputer Co., 329 Flume St., Chico, CA 95926, (916) 891-1730.

KIM-1 FREE TO SEMINAR ATTENDEES. A three-day short course on Microprocessing Fundamentals. Learn on a KIM-1 which you retain after the course. Price of \$595 includes KIM-1, manuals and software. Cities & State Dates: Atlanta — 9/12; Boston — 9/19; Washington — 9/26; Detroit — 10/5; St. Louis — 10/12; Chicago — 10/19; Dallas — 10/26; Cleveland — 11/2. Phone the American Institute (201-377-7400) for details on the KIM-1 course.

Data General MicroNova 48K Bytes Dual Floppies Dasher Fortran or Basic \$12,520 or \$288 per month 5 year lease. BOB CASTLE (714) 540-2312.

IMSAI 8080, 8K, ADM3 I/O, 3 P&S I/O Interface Assembled Tested.(209) 239-1717.

THE TRICKS OF THE EDP PROFESSIONALS — \$8 Save time and money developing business systems-Learn from the pro's with this how-to manual. Send only \$14.95 plus \$1.50 postage and handling to: EDP Professionals, Dept.-C9, 2596 DeFoors FY RD NW, Atlanta, Ga 30318.

MICROCOMPUTING CLASSIFIED EXCHANGE

This special classified section in solid (non-display) format is designed for people who are working with or interested in microcomputing. Through it, you can buy, sell or swap equipment software or services; contact people with similar interests; start clubs; disseminate information; look for game partners; or send messages to other individuals. As the number of ads increases, this section becomes more useful; so we've tried to make ad placement as simple and inexpensive as possible. Details are as follows:

Ordering: The attached form will serve as the simplest way, we feel, to place your ads in Microcomputing Exchange. Please do not use it for other classified sections of Computerworld. They are display format and have different procedures and rates. Publisher reserves the right to refuse ads for this section, to limit the size of ads placed, and to limit the number of ads placed by any one person or company.

Payment: Must accompany your order. No exceptions. Your check will be accepted.

Copy and Closings: Deadline for copy to be in our hands is Friday, ten days preceding Monday issue. All copy must be submitted in writing (no copy taken over the phone), clearly typed or printed. We cannot be responsible for errors in printing made from illegible copy.

Rates: 80¢ per word. All words set in same size and typeface, up to first five words may be boldface. In making word counts, include name and address. Name of city (New York) or state (New Jersey) counts as two words. Zip code or phone number (including area code) counts as one word. (Publisher reserves right to omit zip code and/or abbreviate words if space is tight.) Count each abbreviation, initial, single figure or group of figures or letters as a word. Symbols such as RAM, CRT, etc. count as one word. Hyphenated words count as two words. No commissions paid to agencies.

Box Numbers: Are available at \$5.00 per insertion. Send replies to box numbers to: Box XXXX
Microcomputing Exchange
Computerworld
797 Washington Street
Newton, MA 02160

Mijobe Offers Altair Power

UPLAND, Calif. — A custom power supply kit for the direct replacement and upgrading of the power supply provided with the Mits, Inc. Altair 8800 microcomputer is available from the Mijobe Corp.

The Mijobe kit 10-1026K reportedly

Compiler Basic Comes on Tape

CERRITOS, Calif. — Software Dynamics has a compiler version of Basic for 6800-based microprocessor systems.

The Basic permits decimal arithmetic, formatted output, file I/O and multiple statements per line.

The Basic compiler costs \$150 and comes in a cassette tape formatted for the "Kansas City" standard. Software Dynamics is at 17914 S. Laurelbrook Place, Cerritos, Calif. 90701.

Drives, S-100 Linked

CULVER CITY, Calif. — Info 2000 here has an adapter to interface Persci, Inc. diskette drives to S-100 bus microcomputers, according to the firm.

The adapter costs \$120 in kit form and \$195 fully assembled and tested.

An additional 1K byte of random-access memory costs \$40 and 3K bytes of optional erasable programmable read-only memory costs \$120 from Info 2000 at P.O. Box 3196, Culver City, Calif. 90230.

enables the user to operate a full complement of plug-in boards with a safety margin of power.

The design incorporation of grounded electrostatic shielding between the primary and secondary windings of the kit's transformer virtually eliminates the propagation of external electrical noise into the microcomputer itself, the firm claimed.

The unit operates from 110- to 130 Vac, 60Hz, single-phase power and provides outputs of 16 Vdc +2A and one output of 8Vdc at 20A with forced air cooling.

The unit costs under \$60 from Mijobe at 657 N. Benson, Upland, Calif. 91786.

Wintek Has Interface

LAFAYETTE, Ind. — Wintek Corp. has a cassette interface that operates at speeds up to 2,400 char./sec.

The interface supports the "Kansas City" standard.

The interface sells for \$139 from the firm at 902 N. 9th St., Lafayette, Ind. 47904.

Chess Out in Basic

COCKEYSVILLE, Md. — Chess, in standard Basic, is available from Tenberg Software Systems here.

The program takes 16K bytes of memory, a spokesman noted.

The program, on paper tape with documentation, costs \$20 from the firm at 10311-J Malcolm Circle, Cockeysville, Md. 21030.

Order Form

TO: Microcomputing Exchange
Computerworld
797 Washington Street
Newton, MA 02160

I have read the rules, and would like to place my ad as follows:

Date of first appearance (or "next available issue") _____

Number of weeks ad is to run: _____

Box number desired (add \$5.00): _____

COPY: (Attach copy on typed or printed page if you wish. Please be legible.
Circle up to first five words for boldface.)

Total words @ 80¢ each equals: _____

Plus Box Charge (if any): _____

Equals total cost per insertion: _____

Times total number of insertions: _____

Equals total enclosed: _____

Name: _____

Signature: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone where you can be reached during day () _____

Hobby Havens

As a service to hobbyist readers, Computerworld periodically will list the micro clubs in different parts of the country.

Clubs wishing to be included in this listing should send their name and address as well as the name and address or telephone number of a contact person to Frank Vaughan at Computerworld, 797 Washington St., Newton, Mass. 02160.

ARIZONA

The Arizona Computer Society. The society can be reached at P.O. Box 744, Goodyear, Ariz. 85338.

DELAWARE

Delaware Users of Microprocessor Systems (Dumps). Contact: David Corbishley, 12 Keith St. Kimberton, Newark, Del. 19713. Telephone (302) 737-3367; in New Jersey, telephone (609) 921-3260.

ILLINOIS

The Peoria Area Computer Club (Pacc). Contact: Anthony M. Drake, 2019 N. Idaho, Peoria, Ill. 61604. Telephone (309) 682-5894.

LOUISIANA

Northwest Louisiana Computer Group. Contact: Michael Murray, P.O. Box 8843, Shreveport, La. 71108. Telephone (318) 635-4643.

Debach Computer Club. The society is at Rt. 3, Box 110, Dubach, La. 71235.

Crescent City Computer Club. Contact: Emile Alline, 1119 Pennsylvania, Slidell, La. 70458.

NEW MEXICO

Albuquerque Computer Club. Contact: Gary Tack, P.O. Box 866, Corrales, N.M. 87048.

OHIO

Southeast Ohio Computer Society. Contact: Dennis Anderson, P.O. Box 67, Cambridge, Ohio 43725.

OKLAHOMA

Central Oklahoma Computer Association. Contact: Lee Lilly, P.O. Box 2213, Norman, Okla. 73070.

Oklahoma City Computer Club. Contact: Bill Cowden, 2412 S.W. 45th, Oklahoma City, Okla. 73119.

TEXAS

Texas A&M University Microcomputer Club. The society can be reached at P.O. Box M-9, College Station, Texas 77844.

Heath Course To Teach Basic

BENTON HARBOR, Mich.—Heath Co. introduced a self-instruction course in Basic language programming techniques.

The course was designed "to teach even those with little or no computer experience the skills necessary to intelligently converse, create and program in Basic," a spokesman said.

Programmed instruction tests combined with demonstration programs and practice problems are employed in the course to teach Basic formats, commands, statements and procedures.

The course is keyed to the Heath computer systems; however, because of the universal machine-independent nature of Basic, it can be a supplement to any other computer systems using Basic, the spokesman noted.

The course, EC-1100, costs \$29.95 from Heath at Dept. 350-450, Benton Harbor, Mich. 49022.

Texas Computer Club. Contact: L.G. Walker, Rt. 1, Box 272, Aledo, Texas 76008.

Panhandle Computer Society. Contact: Tex Everett, 2923 Spring, Amarillo, Texas 79103.

Central Texas Computer Society. Contact: Ray D. McCoy, P.O. Box 17303, Austin, Texas 78760.

Microcomputer Tinkers & Bug Busters. Contact: William Peters, 3845 Le Bleu, Beaumont, Texas 77707.

Lamar University Computer Club. Contact: Tim Magnuson, L.U. Box 10996, Beaumont, Texas 77710.

El Paso Computer Group. Contact: Jack O. Coates Jr., 213 Argonaut No. 27, El Paso, Texas 79912.

Computer Hobby Group of North Texas. Contact: Bill Fuller, 2377

Dalworth, No. 157, Grand Prairie, Texas 75050.

Houston Amateur Microcomputer Club. Contact: Cliff Carley, 4506 Woodside, Houston, Texas 77023.

South Texas Computer Club. Contact: Ray Attnip, Suite 125, 11246 S. Post Oak, Houston, Texas 77035.

Permian Basin Computer Group. Contact: John Rabenaldt, P.O. Box 3912, Odessa, Texas 79760.

Northside Computer Group. Contact: Jim Aldridge, 2318 Townbreeze, San Antonio, Texas 78238.

San Antonio Computer Group. The society is located at 7517 Jonquill, San Antonio, Texas 78233.

Nasa-JSC Computer Hobby Group. Contact: Marlowe Cassetti, 1011 Davenport, Seabrook, Texas 77586.

RAM 'Semikit'

EMERYVILLE, Calif. — A 16K-byte random-access memory (RAM) board in semikit form has been introduced by Processor Technology Corp.

The RAM board is, despite the "semikit" name, fully assembled and wave-soldered with pretested integrated circuits.

Board capabilities include independently addressable 4K-byte blocks, 5 watt power consumption, invisible refresh and 400 nsec worst-case access time, he claimed.

The board also has built-in backup power connections, he noted.

The board costs \$369 in semikit form and \$399 fully tested and burned in form from the firm at 6200 Hollis St., Emeryville, Calif. 94608.

Membership means many things to the more than 1000 member units that belong to the Association of Data Processing Service Organizations.

Membership means an opportunity to learn new management skills, to help form industry policy, and to fully understand the business challenges facing the computer services industry.

Toward these ends, ADAPSO offers a wide-range of services:

- Semi-annual management conferences to explore the opportunities motivating this \$5.5 billion industry.
- Management seminars on such timely subjects as turnkey minicomputer systems, advertising, international marketing and data communications.
- Development of positions on such governmental topics as privacy and security and electronic funds transfer.
- Commitment to forming policy on state taxation of computer and software products and services.
- Industry economic reports to use as a planning tool.
- Identification with the only association that represents software, data center and timesharing companies.

On October 19-21, ADAPSO will hold its 17th annual membership meeting and 47th management conference at the Hyatt House on Union Square in San Francisco. The conference provides a chance to learn about the major issues confronting the computer services industry. It will also furnish an opportunity to visit Computer Services Exposition—1, the first exposition held in conjunction with an ADAPSO management conference. Exhibitors can directly market their products and services to several hundred industry decision makers, executives who are responsible for buying such products as computer hardware and terminals, maintenance contracts, security systems, and software products.

ADAPSO 210 Summit Avenue, Montvale, N.J. 07645 (201) 391/0870



I see why ADAPSO is number one. Send me more information on:

ADAPSO membership The San Francisco Management Conference

Computer Services Exposition—1

name _____

address _____

city

state

zip

ADAPSO 210 Summit Avenue, Montvale, N.J. 07645 (201) 391/0870

Compare...
BASF offers you
a 30% saving,
lifetime guarantee,
free field service,
and immediate delivery.



The first name you think of in computers may not be the best choice in data modules. While still completely compatible with existing 3340 drives, BASF data modules cost far less than the drive manufacturer's modules, are guaranteed for as long as you use them, offer free field service, and are available for immediate delivery nationwide.

Before you write your next order for data modules, find out why BASF has more to offer.

Call our nearest regional office: in Bedford, (617) 271-4007; in Los Angeles, (213) 451-8781; in Chicago, (312) 343-6618; in Clifton, N.J., (201) 546-9111; in Dallas, (214) 233-6607; and in Montreal (514) 341-5411.

BASF The Original.

Computer Tapes Disk Packs Flexydisks Word Processing Supplies

COMPUTER INDUSTRY

Settlement Discounted

Interim Relief Viewed IBM Trial Option

By Molly Upton
CW Staff

What are the alternatives to a trial — U.S. vs. IBM — that seems like it will last forever? Justice could ask for interim relief which, if granted, could tie IBM's hands in specified areas. A likely time for such a motion would be at the completion of the government's case, observers recently indicated.

There could be a settlement, but sources generally discount that possibility for the present. One industry analyst, however, said the Greyhound decision [CW, Aug. 29] has increased the possibility of settlements in other cases pending against IBM.

One consultant believes the current anti-

trust case is a smokescreen for IBM. Although the general public thinks it would be unreasonable of IBM to violate the anti-trust laws while the current case is being prosecuted, IBM in fact has received a monopoly license during the "interregnum" since the case was filed about eight years ago, he said.

During this time, IBM has put through a revolution, he said.

All the issues in the government case are academic, the consultant remarked. In effect, the government should abandon this suit and draw up a new complaint based on current IBM actions, he said.

Justice conceivably could ask for interim

relief to prevent a continuation of this "interregnum," he said.

If the Department of Justice asks for interim relief, Computer & Communications Industry Association (CCIA) president A.G.W. (Jack) Biddle thinks Judge David N. Edelstein might well consider the motion favorably, especially in view of the fact that IBM has refused for the last 18 months to stipulate the record.

Without a stipulated record, the trial would go back to square one if Edelstein had to step down from his post, Biddle said.

And if Edelstein granted some form of interim relief, there are good reasons why IBM might not want to appeal it, he continued.

For instance, if the Second Circuit Court of Appeals and/or the Supreme Court denied the appeal, thus concurring with Edelstein, IBM's whole delaying tactic would be "blown sky high," Biddle said.

The Department of Justice, in a motion for interim relief, could seek injunctions forcing IBM to disclose its installed base on a regular basis, disclose to the industry any new de facto standards at the same time as they are introduced internally and forcing it to engage in total unbundling, Biddle suggested.

On the other hand, another possibility is that Edelstein could deny both a motion for interim relief from Justice and IBM's motion for summary judgment, Biddle speculated.

"In my opinion, based on the record, Edelstein will probably deny a motion of summary judgment by IBM because the evidence is overwhelming," Biddle said.

Long Time Coming

Jim Peacock, editor of *EDP Industry Report*, a newsletter from International Data Corp., observed that if the trial continues as scheduled, the decision probably would not be forthcoming until the early 1980s — and then it will be essentially academic unless Justice keeps bringing in new issues, he said.

Thus there is the possibility Edelstein could invoke an interim relief after the government presents its case, he added.

The powers of interim relief can be very broad, Peacock said, observing one judge used them to tell a firm to fire its president.

However, Cal Crary, litigation analyst for Bache, Halsey, Stuart and Shields, sees no possibility of any motion for interim relief in the near future.

(Continued on Page 67)

Two Pico Directors File Charges Against Firm's Chairman Potter

By Toni Wiseman
CW Staff

PLAINVIEW, N.Y. — Two directors of Potter Instrument Co. (Pico) have filed a series of applications and complaints charging company founder and chairman John T. Potter Sr. with misappropriation of company assets, failure to perform duties and harassment.

The actions were filed in the U.S. District Court for the Eastern District of New York here by Samuel A. Alexander, vice-president, and David Porter, secretary, both of whom Potter is seeking to oust as Pico directors.

Counsel for Potter called the claims "inaccurate and distorted," adding only that "Mr. Potter's response to all actions will be contained in his answer which will be filed soon."

In response to the directors' applications, Bankruptcy Judge William J. Rudin signed an order requiring Potter to show cause by Sept. 12 why Pico should continue to pay him "any further remuneration or compensation."

The first action filed by Alexander and Porter asks for the return of two 1971 Cadillac Eldorados which Pico has been maintaining at "a cost in excess of \$1,000 per year per automobile" and of a 20-foot catamaran sailboat. All three items are alleged property of Pico.

In their application to cut off any further

payments to Potter, the directors charged:

- "Potter is not now performing any work or services for Pico and only rarely is he at Pico's offices."
- "He has advised key Pico personnel that he will ruin Pico if he does not regain personal control of Pico."
- "Potter has deliberately attempted to subvert management policies and orders."
- "Potter has solicited and used Pico employees on company time for personal services unrelated to Pico business."
- "Potter has ordered Pico employees to cease work on projects to which they have been assigned and to work on other projects which interest Mr. Potter personally."
- "He has created extreme disruption, confusion and turmoil among Pico employees by making excessive and unwarranted demands for papers, documents and information, by promoting the so-called 'merits' of his lawsuit against ... Alexander and Porter ... and by threatening employees with the loss of their jobs if they did not assist him in his attempts to oust ... Alexander and Porter."

A third action charges Potter "unlawfully received and collected from Pico a sum of not less than \$1,113,629.37 belonging to Pico, willfully, maliciously, wrongfully and unlawfully converted the same to his own use." The action asks for repayment of the sum with interest.

It's only logical that you should expect the best terms from the leader in computer re-marketing.

Comdisco Financial Services, Inc. is our subsidiary that will package the best finance lease arrangement for your new 158, 168, or 470V. We can react quickly to assure you a lease with the best rate and flexible terms. If you need help in disposing of your current system, we will buy it or help you sub-lease it. When you re-think about it, it makes a lot of sense to lease your large systems from Comdisco, the logical choice. Write today or call your nearest Comdisco office.

Re-THINK

Atlanta (404) 256-5956 • Fort Worth (817) 534-1774 • Minneapolis (612) 854-8107 • New Jersey (201) 568-9666 • San Francisco (415) 944-1111

9701 W. Higgins Rd. Rosemont, Ill. 60018 (312) 698-3000

COMDISCO
THE LOGICAL CHOICE®

1
1
3
8

S
E
P

1
9

7
7

UMI

THE SEARCH IS ON

For The Top Sales & Support People In The Computer Industry.

Marketing and Services Information Systems Division (MSISD)

has embarked on a major expansion program, sparked by both the outstanding success of our current state-of-the-art hardware and software systems and the promising new mini, small, medium and large computer systems going into production shortly. Honeywell MSISD is exploding throughout the country and seeks qualified professionals at all levels of experience to join them in the exciting computer future. Honeywell will be a major factor in this future. Talk to us and we will give you the hows and the whys as well as the whats about your future.

Hardware Marketing Representatives

Career and growth opportunities exist for sales/marketing representatives with experience in one or more of the following areas: LARGE SYSTEMS, MEDIUM SYSTEMS, SMALL SYSTEMS, MINI SYSTEMS AND PERIPHERALS. It will be your responsibility to develop and cultivate prospective clients and to ensure that all Honeywell marketing and service functions are coordinated to offer the most effective presentation of the company product lines. Expansion openings exist in major cities coast-to-coast.

Systems Representatives

This extremely important function involves planning,

designing, developing and implementing systems applications and/or modifications to meet specific customer or prospective customer requirements. Career openings exist at all levels of experience from entry level with college degree or equivalent and at least one year programming background. Experience with languages such as: Fortran, Cobol, RPG-II, PL1 and Operating Systems, GCOS, and GMAP is desirable.

Field Engineering Representatives

At Honeywell, we seek Field Engineering Representatives to maintain and service computer systems and/or peripherals. You should have 2 years technical training or equivalent military/industrial electronics experience.

Please forward your resume or the coupon to one of the following appropriate individuals:

HEADQUARTERS
J.W. White
Honeywell
MSY- 202A
200 Smith Street MS/425
Waltham, MA 02154

SOUTHERN
J.L. McGuire
Honeywell
MSY- 202A
6 West Druid Hills Dr. NE
Atlanta, GA 30329

CENTRAL
R.A. Moore
Honeywell
MSY- 202A
4849 North Scott Street
Schiller Park, IL 60176

EASTERN
R.L. Potter
Honeywell
MSY- 202A
300 East 42nd Street
New York, NY 10017

WESTERN
R.J. Beaugrand
Honeywell
MSY- 202A
5959 West Century Blvd.
Los Angeles, CA 90045

FEDERAL SYSTEMS
G.W. Hess
Honeywell
MSY- 202A
7900 Westpark Drive
McLean, Virginia 22101

Openings exist throughout the United States including, but not limited to the following locations: **SOUTHERN**: — Atlanta, Birmingham, New Orleans, Tampa, Orlando, Miami, Richmond, Norfolk, Roanoke, Dallas, Houston, Greensboro, Charlotte, Greenville, San Juan, McLean, and Baltimore — **CENTRAL** — Milwaukee, Madison, Springfield, Peoria, Omaha, Kansas City, Mo., Toledo, Cincinnati, Columbus, Grand Rapids, Louisville, and Indianapolis — **EASTERN** — New York, Boston, Philadelphia, Pittsburgh, Cleveland, Hartford, and Buffalo — **WESTERN** — Seattle, San Francisco, Los Angeles, Denver, Phoenix, Portland and Albuquerque — **FEDERAL SYSTEMS** — Phoenix, Minneapolis, Omaha, Baltimore, Atlantic City, and Washington, D.C. — **HEADQUARTERS** — Boston/Waltham



02A

NAME _____
TITLE _____
ADDRESS _____
CITY _____ STATE _____ ZIP CODE _____
RHONE _____
AREAS & YEARS OF EXPERIENCE _____
POSITION(S) OF INTEREST _____

THE
SEARCH
IS ON

An Equal Opportunity Employer M/F

Honeywell

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.

**USE THE ATTACHED
ORDER FORM AND
THIS ENVELOPE FOR:**

- a new subscription
- new address
- new title
- new industry

Order form is attached through binding. Be sure to include current label or label information when making a change.

first class
permit no 40760
newton ma

BUSINESS REPLY MAIL no postage stamp necessary if mailed in the United States

postage will be paid by



COMPUTERWORLD
797 Washington Street
Newton MA 02160

CIRCULATION DEPARTMENT

What Might Have Been

By Molly Upton
CW Staff

NEW YORK — IBM's Input/Output Division was ready, willing and able to produce lower cost terminals and other peripherals in 1964 than IBM's current product line, according to a memo from G.W. Tuttle to J. McDermott entered as evidence in the U.S. vs. IBM trial here.

The memo outlining the division's capabilities was issued July 17 in response to the System 360/Compatibility Committee's expectation of plug-to-plug competition in both the peripherals and systems areas [CW, Sept. 5].

McDermott was chairman of the processor group of the compatibility committee and Tuttle was a member of the I/O group.

The memo contained recommendations from the Product Review Board of the I/O Division.

The I/O Division was also developing a "flexible file" with a capacity of up to 11 million characters.

"We feel in looking over our laboratories that we can develop a complete line of terminal equipment at more

than 20% off IBM prices. Evidence that this can be done has been shown by the Friden Collectadata, the Tele-Register 200 and the Teletype Data Speed.

"In addition, we are planning to spend additional development dollars for industry-oriented terminals," Tuttle's memo said.

The I/O Division planned to make tape drives that it considered to be attractively priced for use in conjunction with the 360. The prices per drive were about \$100 less than those quoted for current IBM drives.

The controller for printers and I/O equipment proposed by the division would be a nonprofit item priced at about \$600 compared with the IBM existing price of \$1,045.

"We will continue our development work, however, on a flexible file with a goal of \$475 to \$675 with a control price of \$350. This file will have a capacity of up to 11 million characters and would compete with the 2311 which rents for \$575 with the control at \$525 and a capacity of 14.5 million," the memo said.

ENTREPRENEURS

ComputerLand™

Personal computers are the world's newest, most exciting and the fastest-growing business. ComputerLand, our turn-key computer franchise network, lets you get in at the ground floor. Unlimited potential. Complete training program.

Enter COMPUTERLAND.

Personal microcomputers are sold to business, science, education, the professions, as well as the explosively growing hobbyist market. Computerlands offer microcomputers, modules, tools, books, accessories; provide equipment assembly and testing. Each store has a traffic-building game room. Choice locations available.

Call or Write:
Ed Faber, President

(formerly
Computer Shack Inc.)

ComputerLand Corp.
1922 Republic Ave.
San Leandro, CA. 94577
(415) 895-9363

DATAPPOINT USERS

Check these printer features

- Full 132 column lines at 300 LPM
- Standard 96 character set plus 64 additional characters of your choice
- Plotting also, operation in the plotting mode permits unlimited versatility of use.
- System operation with all Datapoint processors
- Remote operation - serial or parallel
- Multi-system printer selection
- Savings, printer price under \$6,000.00.



D&O LEASING, INC.
specializes in line printers
for the Datapoint user.

For information call:

23011 Moulton Parkway E-6
Laguna Hills, CA 92653
714-581-0333/2222

or contact

Resource Data Systems
801 Skokie Blvd.
Northbrook, IL
312-564-5440

Interim Relief Seen Trial Option

(Continued from Page 65)

Justice could conceivably file such a motion at the time Edelstein announces his decision, he said. Edelstein's ruling will probably favor the Justice Department, Crary added.

He expects IBM to file for summary judgment and added he would be very surprised if Edelstein granted that.

Commenting on the Ninth Circuit Court of Appeals' decision remanding the Greyhound Computer Corp. vs. IBM antitrust case back to trial, Peacock said it could open the door for more settlements between various plain-

tiffs and IBM.

He declined to speculate on whether the Justice case might also be a candidate for settlement. The stakes are bigger and the process interminable, he commented.

However, he said, the others will settle if the price is right.

The Ninth Circuit's extensive opinion seemed to clarify a lot of issues in the cases from a legal point of view and should certainly improve the atmosphere for settlement by IBM of some or more of the

cases, he said.

The decision in the Greyhound case means it is very likely the California Computer Products, Inc. vs. IBM case will also go back to trial. In addition, "now Memorex knows what kind of atmosphere it is looking at up the ladder, so the signs are not great for IBM, which might be more willing to settle some cases," he observed.

The Ninth Circuit is also the appeals court for the Memorex and Calcomp cases, he noted.

AVAILABLE IMMEDIATELY FOR SALE OR LEASE

IBM 3271-2 remote controller
IBM 3277-display station-480 or 1920 characters
IBM 1061, 1062, 2740, 2980, banking terminals, etc.

IBM 3272-2 local controller
Nov., Dec. availability, lease only

Call collect or write:
BERLENT INDUSTRIES INC.

1975 Hempstead Turnpike in East Meadow
New York 11554
(516) 794-9722

(CDA) Computer Dealers Association

1 & 2-year leases from RANDOLPH

370/138

370/148

370/135

370/145

...and all other 370's from 115's ... to 168's. CPU's or full systems. Up to 8-year lease available.

CALL THE 370 HOTLINE
800-243-5307



WANTED:

3420 Tapes: MOD 3's, 5's, 7's
135/145 Subleases or purchase

800-243-5308

Randolph Computer Company
537 Steamboat Rd., Greenwich, CT 06830
(203) 661-4200

V
1
1
3
8

S
E
P

1
9

7
7
UMI

DBL Cites Problems

Reports of Japanese Threat Called 'Exaggerated'

By Toni Wiseman

CW Staff

NEW YORK — The Japanese computer industry's threat to IBM and other U.S. manufacturers has received a great deal of coverage, but that coverage has been largely one-sided and exaggerated, according to a report published by Drexel Burnham Lambert, Inc. (DBL).

In fact, the report listed 17 separate reasons why the Japanese may not be so tough.

The report acknowledged several truths: the Japanese government has "(1) organized consortiums of computer companies, (2) assigned specific tasks to each company, (3) subsidized computer R&D, (4) purchased domestically made computers almost ex-

clusively and (5) provided financing for companies leasing Japanese com-

panies for selling computers in quantity," it said, but "a maintenance network is hard to start, difficult to staff and expensive to support."

Depressed Stocks

"In recent months, the stocks of American multinational companies have been depressed because of fears of foreign nationalism and lagging economic growth overseas," DBL stated.

"Those same problems would affect Japan, Inc. even more than [its] U.S. counterparts, yet the Japanese threat appears to remain undiminished in the eyes of many analysts."

"Moreover, in most countries, U.S. companies have become firmly entrenched and tolerated, while the Japanese have become unwelcome because of their surging exports and resulting trade imbalances."

"Japanese computer exports represent a threat to the status quo and, ipso facto, the health of struggling foreign computer companies."

While many view Japanese government subsidies as an added threat to the U.S. market, the report observed that many of these subsidies cannot be transferred abroad — i.e., government purchases of Japanese computers and financing of domestic leasing firms.

"So although the Japanese computer industry has enjoyed considerable success at home, it may not be indicative of the potential for success overseas," the report said.

In fiscal 1976, Japan produced about \$2.5 billion in computer equipment, of which \$71 million was exported, the report noted. Even if exports grew at the government's goal of 30.4% per year, Japanese exports would reach only \$1 billion by 1985, a year in which IBM revenues should be about \$50 billion, according to DBL.

"Moreover, a portion of Japanese computer exports will go to markets not heavily served by U.S. companies, such as China and Korea. . . In any event, weak foreign computer companies will very likely suffer proportionately more than U.S. computer companies if Japan, Inc., were successful," the report stated.

We'll
keep you
up to date
week,
after
week,
after
week,
after
week . . .

**Subscribe
Yourself.**



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

International News

puters."

However, without wishing to belittle the Japanese threat, DBL emphasized that "formidable obstacles stand in the way of Japan, Inc." and that in its opinion "the brouhaha about the potential impact of Japanese exports on U.S. computer manufacturers has been exaggerated."

The report pointed out, for instance, that while several countries have successfully competed with Japan for various export markets, such as Germany and automobiles, only the U.S. has ever successfully exported computers.

In addition, computers are more complex than any other product that Japan has successfully exported, it said.

Software is a third problem for the Japanese. "Japan may have caught up with the U.S. in hardware, but industry experts acknowledge that Japan is still far behind in the development of software," DBL stated.

The report also suggested the Japanese might face language problems in Western Europe, which Americans would not since English is widely spoken.

"The language barrier does not pose a serious problem when selling consumer or price-oriented products; however, it presents a formidable obstacle when selling complex products, such as computers," the report indicated.

And then there is IBM. IBM's recently announced 3033 has 2.5 times the price/performance of a 370/168-3, the report noted, adding this is the market the Japanese will be competing in since, in 1976, 57% of the Japanese installed base was large-scale systems.

DBL saw service as another possible problem for the Japanese. "A network of maintenance centers is a prere-

Think Dumb.

EMM Expands in Europe

Special to Computerworld

BAD HOMBURG, W. Germany — As an extension of its expanded commitment to the end-user business, Electronic Memories & Magnetics Corp. (EMM) has expanded the European operations of its Computer Product Division.

The success of its add-on memory

International News

business philosophy in the U.S. has prompted the independent supplier of add-on memory to capitalize on the potential abroad, it said.

EMM started this foreign expansion with what it already considered a strong market position. It has established EMM GmbH as its European divisional headquarters here. The sales and service operations are directed from this centrally located area, which also has easy access to Eastern Europe.

The sales staff presently operates from Germany. However, additional salesmen will be appointed in the near future and will be located in major market areas. The company also has appointed agents in the UK, Switzerland and Austria.

Reference selling is important in Europe and the company believes it is in a good position to draw on its current customer base and parlay that

success into bigger and better things. Major installations are already in Swiss and French banks, a major German automobile manufacturer and a major European airline.

Also included are one of Germany's more prominent breweries; a large construction company; one of the world's largest multinationals; and Eurocontrol, the air traffic control operation built by the common market countries and the North Atlantic Treaty Organization. Products installed cover a wide variety — from IBM 360/65s to 370/168s — with as much as 5M bytes of memory.

Eastern Market

In addition to this list, EMM has three orders from Rumania and one from the USSR. The Eastern European market appears to have enough profit potential for EMM to position itself accordingly, a spokesman stated.

Under the direction of Dieter Huhn, European sales manager, the headquarters has been staffed with "a number of people whose expertise is commensurate with the company's overall commitment," according to the spokesman.

The staff personnel offer varied backgrounds in engineering, sales and marketing — including past associations with IBM, Siemens, 3M and CMI.

EMM is looking to this European operation as a key element in future growth plans, the spokesman said.

Foreign Orders & Installations

The Centro de Investigacion Cientifica y Educacion Superior de Ensenada, a scientific research and educational institution funded by the Mexican government, has ordered a Prime Computer, Inc. Prime 400 computational timesharing system to be used for seismic and oceanographic analysis projects.

The Overseas Fixed Telecommunication Service has ordered Codex Corp. 6000 Series Intelligent Network Processors and LSI high speed data modems worth over \$1,000,000.

Toyota Auto Body Co., a Japanese

automobile body manufacturer, has ordered a Univac 1100/11 system for use in on-line control system covering planning, prototype production, testing and preparation of new cards.

The Telephone Authority of Singapore has ordered 300 medium-speed modems from General Datacomm Industries, Inc.

The Australian Broadcasting Commission has ordered two PAL version Compositor 1 systems from TeleMatrix, Inc. to be used for graphics generation in their Melbourne and Sydney stations.

International Studies Set

MANCHESTER, England — The Council of the European Communities has approved a group of studies in support of the use of data processing which will be carried out in collaboration between The National Computing Centre in the UK, Gesellschaft fur Mathematik und Datenverarbeitung (GMD) in Germany, Institut de Recherche d'Informatique et d'Automatique (Iria) in France and Consiglio Nazionale Delle Ricerca (CNR) in

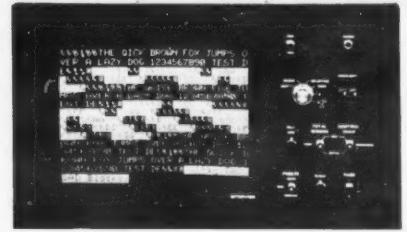
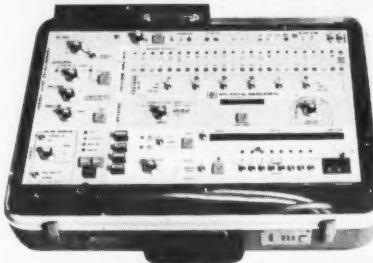
Italy.

The studies, which cover work related to privacy and security, data base and programming techniques, will be financed half by the European Economic Community (EEC) and half by the various nations concerned.

Given approval for the further stages currently envisaged, the cost of the entire program for all four countries will probably total about \$1.4 million.

Now-a DATA COMMUNICATIONS TEST SYSTEM YOU CAN GROW INTO

INTERSHAKE II/INTERVIEW (CRT)



Designed for today and tomorrow

Monitoring — Simulation — Data Acquisition

The most powerful portable or rack-mounted data communications test system available today—Intershake II/Interview will monitor full duplex transmissions at speeds up to 256 Kbps, display all or selected transmissions, trap and record protocol or messages, make timing measurements and record status of all EIA/V.24 leads at any time in the test. Powerful new jump and branch instructions permit on-line test subroutines for fully defining anomalies.

As a simulator, Intershake II will duplicate any modem, front end, terminal—even a cluster of terminals. And with a program of 1024 steps with nonvolatile memory, Intershake is ready to go when you are.

Most importantly, Intershake II/Interview will run tests, measure results and retransmit the results to your printer or CRT. Used as a full-time performance evaluation system, Intershake II/Interview will pay for itself by identifying and eliminating excessive turnaround times, downtimes, extra sync and pad characters and system degradation (excessive NAK's) before the system washes.

Intershake II/Interview—another quality product from



ATLANTIC RESEARCH CORPORATION

5390 CHEROKEE AVENUE • ALEXANDRIA, VIRGINIA 22314

703-354-3400

Think about the world's most popular video terminal. Chances are you're thinking about the Dumb Terminal™.

Because with a 24-line screen, and 1920 bright, easy-to-read characters as standard equipment, it would be difficult to come in second best. Especially at a price of \$895. (Even for the Dumb Terminal™.)

In fact, the more you look at it, the smarter it is to think Dumb.

1
9

7
7

UMI

Intel delivers PDP-11 memory for people who can't afford to wait.

When you're in a hurry for more semiconductor memory for your PDP-11, call Intel. We deliver memory for the full PDP-11 line. And because we're the largest manufacturer of semiconductor memory in the world, delivery is when you want it.

Why wait? Since you've chosen the leader to supply your minicomputer, it makes sense to go to the leader for memory, too. That's us.

Intel memory systems save you more than time. Our in-1670 add-on memory for the PDP-11/70 is one example. It gives you four times the capacity in the same frame compared to the DEC MJ11-A core memory. And built in Error Correction Code (ECC) and Error Logging improve up-time and reduce maintenance time by automatically correcting and recording single-bit failures and detecting and recording double-bit errors.

For PDP-11 add-in memory go with our in-4711 plug in boards. You'll get memory that's even faster than DEC's. 16K words per hex-wide board. With or without parity. To further expand PDP-11 memory and reduce UNIBUS™ loading choose our in-4011 add-on. With memory management you can expand to 128K words in 16K increments. And since the in-4011 requires only one UNIBUS load, you get added system flexibility.

Get more memory for your LSI-11 and PDP-11/03 in less space with our in-1611 add-in memory. You get up to 32K words, in 8K increments, on a single, two-wide, board. That's up to eight times the memory you get with a DEC board.

When you can't afford to wait call us at 800-538-8476. In California and Canada, call 408-734-8102, x575. We'll save you time, and much more.

intel delivers.

Intel Memory Systems
1302 N. Mathilda Avenue
Sunnyvale, California 94086

I can't wait! Must have delivery in 5 Days 30 Days _____ Days

Please call me at _____ / _____ Ext. _____

Please send me information on semiconductor memory for the following:

- LSI-11, PDP-11/03
- PDP-11/04
- PDP-11/05
- PDP-11/34
- PDP-11/35

- PDP-11/40
- PDP-11/45
- PDP-11/55
- PDP-11/70

Name/Title _____
Company _____
Address _____
City/State/Zip _____
Mail Station _____

UNIBUS is a trademark of Digital Equipment Corp. Maynard, Mass.

Adapso Sets Theme

SAN FRANCISCO — "Responding to Change — A Program of Action" is the theme for the Association of Data Processing Service Organizations' (Adapso) 47th Management Conference.

The conference, which will be held in conjunction with Adapso's first computer services industry exposition, will take place at the Hyatt Hotel on Union Square here Oct. 19-21.

Workshop topics will range from "User Panel: Why Buy Computer Services," "Running a Small Data Center for Profit" and "How to Make Money in the Mini-Micro-

OEM Marketplace" to "Taxation," "Acquisition Strategy" and "Is There Any Accounting for Software?"

There will also be general sessions dealing with communications activities, security and the computer services industry and IBM and the U.S. computer services industry.

Registration for the conference is \$195 for Adapso members and \$295 for nonmembers, with discounts for additional registrants from the same company. Further details are available from Adapso at 210 Summit Ave., Montvale, N.J. 07645.

Acquisitions

Dun & Bradstreet has agreed in principle to acquire **Technical Publishing Co.**, publisher of *Datamation*, for Dun & Bradstreet stock with a current market value of about \$45.6 million.

TRW, Inc. has acquired **Gier Electronics GmbH** of Hanover, a German distributor of American DP equipment.

Perkin-Elmer Corp. and **Physical Electronics Industries, Inc.** have merged. Under terms of the agreement, four shares of Perkin-Elmer common stock will be exchanged for each share of Physical Electronics common, resulting in the issuance of approximately 540,000 shares of Perkin-Elmer common. Physical Electronics

will operate as a wholly owned subsidiary of Perkin-Elmer.

Systems Dimensions Limited (SDL) has received a formal offer from **Sun Life Assurance Co. of Canada** to purchase all common shares of SDL at a price of \$4.50 (Canadian) per share.

Itel Corp. has acquired certain assets of **Bankputer Corp.** for an undisclosed amount of cash.

Medical Computer Systems, Inc. has agreed in principle to acquire all of **Health Management Corp.**'s 1,040,000 common shares outstanding through a swap of stock.

Digilin, a manufacturer of digital panel meters, has been acquired by **Dynamic Sciences, Inc.** for cash.

Membership Still Open In Battelle EFT Program

WASHINGTON, D.C. — If you supply or are interested in suppliers of electronic funds transfer (EFT) systems, you might want to investigate a research program currently being conducted by Battelle Memorial Institute.

Titled "A Worldwide Study of Electronic Funds Transfer Systems and Equipment Requirements," the proprietary project is the third in a series of international payment systems studies run by the institute.

Co-sponsored by several supplier organizations, the study will analyze the market for EFT delivery systems and components within selected countries.

EFT models will be developed for each nation investigated, including Belgium, Canada, France, Germany, Italy, Japan, The Netherlands, Spain, Sweden, Great Britain and the U.S., according to Joanne Hartley, the project's manager.

An initial interactive workshop session with the sponsors has been held at Battelle Columbus Laboratories, but membership in the program is still open, Harley said.

In profiling the worldwide markets for EFT delivery system components, the Battelle project team will analyze global issues that affect all suppliers as an industry, as well as specific issues which affect different supplier types, Hartley said.

Among the issues to be investigated are standards, security, communications traffic, transitional technologies

and functional specifications for EFT equipment, Hartley said.

The institute hopes for as much interaction as possible between the clients of the study and its project team.

A major Battelle objective is to determine what experience or technology might readily be transferred from one country to the next, the project manager stated.

The sum of \$18,000 and participation will give you a full sponsorship in Battelle's study. Further information is available from Hartley at the institute's Washington operation, 2030 M St. N.W., Washington, D.C. 20036.

CCIA Reelected Amdahl

WASHINGTON, D.C. — Dr. Gene M. Amdahl, chairman of the board of Amdahl Corp., has been unanimously reelected chairman of the Computer & Communications Association's (CCIA) board of directors.

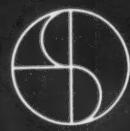
Four regional vice-chairmen were also elected: Timothy C. Cronin, chairman of the board of Inforex, Inc., for the eastern U.S.; Harold E. O'Kelley, president of Datapoint Corp., for the central U.S.; Ryal R. Poppa, chairman of the board of Pertec Computer Corp., for the southwestern U.S.; and Richard Lussier, executive vice-president of Itel Corp., for the northwestern U.S.

A.G.W. Biddle was reelected to the post of CCIA president.

IRIS

The foremost business operating system for NOVA* type minicomputers

New Features: BUFFER POOLING PARTITIONING



Educational Data Systems

1682 Langley Ave. • Irvine, California 92714 • (714) 556-4242

*Trade name of Data General Corporation

V
1
1
3
8
S
E
P
1
9
7
7
UMI

DDP Seen Making Users More Independent

BOSTON — As the industry moves toward distributed processing, users will and should become considerably more independent than they have been traditionally, according to an NCR executive.

"They no longer see themselves tied to a particular vendor," G.P. Williamson, an NCR marketing vice-president told a group of electronics analysts here recently.

"In fact," he said, "the particular vendor to whom they are most likely tied has not, typically, been a leader in moving into distributed processing. More likely than not, when today's user begins implementing a distributed processing network, he will be moving into a non-IBM world."

Williamson said the key element in

distributed processing is the inclusion of a distributed data base. "It means that not only is processing power distributed to whomever needs it, but also that the data base is distributed along with responsibility for the system."

Distributing responsibility for the system to the end user, Williamson added, is one of the biggest reasons distributed processing will eventually become the dominant form of processing.

End User Responsibility

"Complete responsibility can be fully allocated to the actual end user of the system," he said. "The people who control the budget and put out the money will no longer have to handle DP as a single general-overhead type

of account. They can allocate its cost to a specific end user, just as they allocate payroll or material costs today.

Also behind the trend toward distributed processing, Williamson said, is the reduction in processing costs.

"We are on a downhill cost curve so far as memory, processor and communications costs are concerned, and those lower costs are making possible different approaches to information handling."

"In the area of memory, charge-coupled devices and bubbles, now becoming commercially feasible, offer great potential for lowering costs in some applications. Fixed-head disk technology, solid-state storage, and helical-scan, mass-storage systems promise equally dramatic price/per-

formance improvements in the area of auxiliary storage."

Although the trend toward distributed processing is very strong, it will be several years before it materializes on a wide, general scale, Williamson said.

One reason is that large CPU's still enjoy a price/performance advantage over small systems. "However, given the continuing decline in the absolute amount of cost difference in units of processor power between large and small computers, it is becoming increasingly attractive to exchange this large-system advantage in return for the efficiency gains achieved when information, processing power and the responsibility for them are placed where they are most needed," according to Williamson.

A second reason for distributed networks' not becoming widespread overnight, he said, is that the currently installed base of computer systems is primarily a centralized, batch-oriented base. "That investment in equipment and software cannot be lightly tossed aside. It will continue in place and will be enhanced. Existing equipment and systems continue to function; new systems will supplement, rather than replace current systems."

Williamson also cited the current lack of distributed data base software. "It is for that reason, more than any other, that today the industry finds itself primarily in an era of announcements so far as distributed processing is concerned. The technology is here and systems are in operation. Generalized systems are on the drawing boards and in fairly advanced stages. But the missing link is software. In the end, it will be software — data base software, terminal control software, networking software — that will determine success or failure in this field."

System 'Free' With Software

IRVINE, Calif. — Liberal Computer Corp. is promoting the concept of "rebundling," according to chief executive officer Bernie Lambert.

The firm plans to provide a microprocessor-based system free — along with the \$200 monthly rental fee for software, he said. There will be an additional charge for customized software, he added.

Liberal's product will be called the "Generous/1" and will consist of a Motorola 6800 with 32K, a Shugart floppy disk drive, a Lear Siegler CRT and AT&T's Dataspeed Model 43, he said.

Initially, Lambert plans to concentrate on the word processing and text editing area and then broaden into small business applications such as general ledger, he said.

More specifically, he said, he is looking at the mortgage banking document area as well as packages for small banks.

The time has come once again for "rebundling," he said, noting Eastman gave away cameras and Gillette gave away razors when starting their businesses.

Liberal Computer Corp. is at 4301 Birch, Newport Beach, Calif. 92660.

SUBSCRIBE TO THE 1977 COMPUTERWORLD INDEX AND GET SIX MONTHS OF REFERENCE INFORMATION FREE.



The new Computerworld Index, published quarterly and cumulative, is an invaluable reference tool for organizations that have a need-to-know about what's going on in the computer world.

The first issue of the Index for example, covers the last six months of 1976, and it includes more than 4,000 entries by subject, author and name of any company mentioned. It breaks topics down into highly usable and convenient categories:

- There are entries by *product or service*, like PRINTERS, which has 37 entries in the six-month period covered; or LEASING, which has 10.
- There are entries by *industry*, like INSURANCE, under which there are 17 entries for various stories on the use of computers in the insurance industry.
- Types of computer *applications* is another way you can look something up in The Index. The category INVENTORY SYSTEMS, for example, has 21 entries.
- *Regulatory, security and social issues* are also indexed. There are 34 entries under PRIVACY, 10 under PRIVACY ACT and 9 under PRIVACY PROTECTION COMMISSION, for example.
- The Index also makes it easy to look into *legal aspects of computer use* with categories like LITIGATION, which has 24 entries in the last six months of 1976.
- Even *foreign countries* are indexed. The category JAPAN, for example, has 9 entries.
- ... and there are others: KIT COMPUTERS (the kind you build yourself) are the latest thing, and The Index shows 5 entries. POINT-OF-SALE SYSTEMS has 14 entries ... and there's much, much more.

Company Names, for example, are a very important part of The Index. Looking under IBM, we find ten categories:

- | | |
|------------------|-----------------|
| • IBM GENERAL | • IBM HARDWARE |
| • IBM LITIGATION | • IBM PRICING |
| • IBM SOFTWARE | • IBM POLICY |
| • IBM SYSTEM 3 | • IBM SERIES 1 |
| • IBM SYSTEM 7 | • IBM SYSTEM 32 |

Our special, no-risk offer:

Subscribe to one year of the Computerworld Index (4 quarterly issues, published three months after each quarter ends and cumulative) at the regular rate of \$150; and we'll send you the Index for the last six months of 1976 FREE. In addition, we'll give you ten days to look over the 1976 Index AT NO OBLIGATION. Should you decide it's not what you need, just return it to us marked "cancel" and we'll cancel your subscription.



CIRCULATION DEPT.
797 Washington Street
Newton, MA 02160

Please enter my subscription for one year (four issues) of the Computerworld Index for \$150 and send me my copy of the June-December 1976 Index for 10-days inspection, along with my bill. I understand that I have ten days to return the Index and cancel my subscription with no obligation.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

GAINING MANAGEMENT CONTROL OF TSO

... a seminar for EDP professionals interested in systematically planning, controlling, and evaluating the use of TSO.

... presented by Mario Morino of MORINO ASSOCIATES, INC.

Topics will include —

- the time sharing management problem
- establishment of management objectives
- implementing a planning mechanism
- management reporting strategies
- discussion of the TSO/MON product

If you are interested in the management and control of TSO you should make plans to attend (no tuition fee of course).

Washington, D.C.

October 6

Hyatt House - Arlington, Va.

Toronto

October 13

Sheraton Centre Hotel

New York

October 14

New York Hilton

Chicago

October 18

Holiday Inn O'Hare-Kennedy

Houston

October 19

Travelodge Hotel

Los Angeles

October 20

Airport Marriott



• Please enroll me in
the half day seminar at _____ CITY _____ DATE _____

• Please send me more information

• Name _____

• Title _____

• Company _____

• Address _____

• City/State/Zip _____

• Telephone _____

• _____

• _____

• _____

MORINO ASSOCIATES, INC.
1401 Wilson Boulevard • Suite 101 • Arlington, Virginia 22209
(703) 524-5500

V
1
3
8

S
E
P

1
9

7
7
UMI

position announcements

position announcements

position announcements

position announcements

position announcements

POSITION ANNOUNCEMENTS

UNIVERSITY OF ILLINOIS COMPUTING SERVICES OFFICE URBANA CAMPUS

THE FOLLOWING POSITIONS ARE OPEN WITH THE COMPUTING SERVICES OFFICE:

Computing Documentation Writer

This full time position involves the writing/editing and maintenance of a large scale user document for the services offered on a CDC CYBER 175 and an IBM 360/75. A knowledge of computer programming, experience with time-sharing systems, a university degree with a background in communication arts and experience in composing and/or editing computing documentation are required. The position offers avenues for imaginative expression and initiative. Initial salary: \$11,000 to \$13,000.

Statistical Computer Consultant

This full time position for a statistical computing consultant involves the research, development and maintenance of statistical software on the CDC CYBER 175 and IBM 360/75 computers. The ability to help computer users with statistical computing is of prime importance. This individual should also have the following qualifications:

- General statistical knowledge a must, while experience with statistical software (SPSS, SOUPAC, SAS, BMD, etc.) desirable.
- Programmer/analyst experience with FORTRAN a must, while knowledge of CDC NOS and IBM OS operating systems desirable. All applicants should have at least one year of experience in the areas described above, and have a university degree with a background in statistics and computer science or closely related fields. Initial salary: \$11,000 to \$15,000.

Research Programmer—Senior Research Programmer

This full time position is for an individual with demonstrated skills and achievements in at least one of the following areas:

- CYBER 175 NOS systems programming, development, and performance analysis.
- IBM 360 HASP-OS/MVT systems programming performance analysis and maintenance.
- DEC PDP-11 systems programming and hardware development, with an accent on on-line applications.
- Systems measurement and quantitative performance analysis.
- Synchronous and Asynchronous data communications measurement, analysis and development. Knowledge of CDC 2550 desirable.
- Development and implementation of large storage hierarchies. All applicants should have at least two years experience as a systems programmer, and have at least a bachelor's degree with a strong mathematical basis. Initial salary: \$12,000 to \$18,000.

SEND RESUMES BY SEPTEMBER 30, 1977 TO:

Director, George F. Badger, Jr.
Computing Services Office
150 Digital Computer Lab.

University of Illinois
Urbana, Illinois 61801

The University of Illinois Is An
Equal Opportunity/Affirmative Action Employer

PROGRAMMERS

SYSTEMS PROGRAMMERS

Fluor Corporation, a dynamic and internationally respected leader in the engineering and construction field, has immediate openings for CDC Cyber 170 systems programmers with SCOPE OR NOS/BE experience.

OPERATING SYSTEM SUPPORT

- A minimum of 2 years' experience maintaining a CDC SCOPE 3.4 or NOS/BE operating system.
- Proficiency with CP and PP COMPASS
- Experience in analyzing dumps from system failures and generating/locating corrective codes.
- Familiarity with basic internals of SCOPE or INTERCOM

The individuals selected must be able to maintain a stable version of NOS/BE at current PSR levels. Additional duties will include installation of local modifications, evaluation of system performance and user consultation.

PRODUCT SET SUPPORT

- A minimum of 2 years' experience with internals of compilers and compiler object time routines
- Proficiency with CP COMPASS and/or SYMPLEX
- A working knowledge of FORTRAN and COBOL

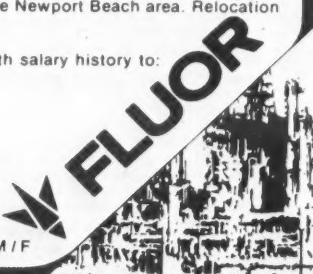
The individuals selected will be responsible for maintenance of product sets, installation and testing new versions supporting applications programmers, writing utilities and specialized subroutines in the area of application support.

Our employees enjoy excellent benefits including profit sharing and savings investment program. Positions are located in our new innovatively designed facility in the Newport Beach area. Relocation allowance available.

Please send resume, complete with salary history to:

Nellie M. Bedford COM919
FLUOR CORPORATION
P. O. Box 11977
Santa Ana, CA
92711

Equal Opportunity Employer M/F



R.O.I.

ROI has been retained to conduct a search for a:

COMPUTER SCIENTIST

Our Fortune 500 client has an unusually attractive, high visibility position for a true COMPUTER SCIENTIST, one who possesses the ability to work on the conceptual design level, right thru to the prototype stage. As part of this internationally respected "elite" Research and Development group, the incumbent will be involved in a wide mix of projects ranging from theory to applied research, including numerous highly advanced STATE-OF-THE-ART Computer Technologies.

To qualify for this position you should be an independent thinker and have the initiative, desire and capability to lead other professionals at the leading edge of CONTEMPORARY Software specifications and engineering. An M.S. or Ph.D. in Mathematics, Computer Sciences, Electrical Engineering (or equivalent experience) is required.

This key position requires a demonstrated ability and adaptability with a wide range of mini-computer executive/operating systems at the conceptual, design and implementation stages.

Applicants should have the ability to anticipate problems and conceptualize solutions in the following areas of involvement.

REAL TIME PROCESSING

Distributed Data Base

NETWORKING

DECNET

COMMUNICATIONS

DNA

Distributed Computers Multiprocessors

MESSAGE ORIENTED SYSTEMS

Loosely coupled virtual machines

Our client wants to FULLY UTILIZE YOUR INTERESTS AND TALENTS and offers excellent starting salary, a full range of company paid benefits and a dynamic atmosphere in which to grow professionally and prosper.

This is an unparalleled career opportunity. For immediate (and totally confidential) consideration CALL OUR STAFF or forward your resume to:

RESOURCES
Objectives, Inc.

131 middlesex turnpike, burlington, massachusetts 01803

(617) 273-2130

An Equal Opportunity Employer

COMPUTER PROGRAMMERS

Remember Last Winter?

Opportunity to move to Florida. We are the largest teaching hospital and we offer challenging opportunities for programmers with the following background:

COMPUTER PROGRAMMER

1-3 years experience in financial systems with heavy accounting background using COBOL. Some CICS experience helpful.

CICS PROGRAMMER

1 year CICS in applications programming in BAL. Some DLII experience helpful.

SYSTEM PROGRAMMER

Actual systems software experience in IBM DOS-VS environment including systems generation of DOS-VS and/or CICS is required. CICS experience preferred.

We offer excellent salary and benefits plus an opportunity for personal and professional growth. Send detailed resume, including salary history and availability in strictest confidence to:

Ms. Cynthia Robinson
Employment Office
**JACKSON MEMORIAL
HOSPITAL**
1611 N.W. 12th Avenue
Miami, Florida 33136
Equal Opportunity Employer

Data Processing Professionals

At Motorola we offer exciting and rewarding careers to dedicated and experienced data processing professionals who are anxious to become associated with a company whose history is one of well planned growth and whose future is assured by an investment in superior products in an ever expanding market.

If you combine imagination, education, and experience and want to channel it in an environment where you can enjoy the freedom to excel, to offer suggestions and recommend changes, we at Motorola can offer the following career opportunities with Corporate Information Systems:

BUSINESS SYSTEM ANALYST

Must be effective in understanding and designing logical, well structured systems to satisfy identified financial business problems and have the ability to provide an effective link between the user and data processing departments. Good accounting or payroll/personnel background and communication skills is necessary.

SENIOR PROGRAMMER

3 to 5 years experience in using COBOL, JCL, programming utilities and interpreting core dumps on large IBM/370 equipment utilizing OS/VSE; assembler language and DL/1 coding experience a plus. Prior computer system work should include Fund Accounting or Employee Benefits Systems.

MAINTENANCE PROGRAMMER

Minimum of one year in maintenance programming with a thorough understanding of OS/VSE, JCL, catalogued procedures and utilities, program debugging and OS/VSE dump reading. Requires experience with IMS/VS Data Base and/or Data Communication, MARK IV experience and working knowledge of TSO a plus.

DATA BASE ADMINISTRATOR

Minimum two years experience in Assembler Language Coding, IMS Data Base and Data Communications Coding, IMS Data Base Design, COBOL Programming. Working knowledge of a Data Dictionary System, TSO programming debugging and OS/VSE Dump Reading.

For immediate consideration, forward resume in complete confidence to:

MOTOROLA INC.

CORPORATE STAFFING
1303 E. Algonquin Rd.
Schaumburg, IL 60196

equal employment opportunity/
affirmative action employer

V
1
1
3
8

S
E
P

1
9

7
7
UMI

position announcements

position announcements

position announcements

position announcements

position announcements



New Careers in Software

San Francisco Peninsula

The creation of our new Software Technology Department in Special Programs Operation at Ford Aerospace and Communications Corporation has resulted in a need for a number of senior analysts or computer systems specialists. The individuals we are looking for will have advanced degrees and/or three years' experience in one or more of the following disciplines:

- Software engineering/software development methodology
- Data base management/distributed processing
- Image processing
- Minicomputer based systems (PDP-11, SEL 32, Eclipse)
- Computer networking/ARPANET protocols
- Microprocessor software development
- Operating systems (UNIX, RSX-IID)

We offer outstanding compensation and benefits packages, coupled with the opportunity and challenge of working in this new area. For immediate and confidential consideration, please forward resume and salary history to Professional Employment, Dept. JJL-40.



Ford Aerospace & Communications Corporation

Western Development Laboratories Division
3939 Fabian Way, Palo Alto, California 94303

An Equal Opportunity Employer M/F

MIAMI-DADE COMMUNITY COLLEGE
Largest Two-Year College in the Nation
In Beautiful, Sunny Miami, Florida

SYSTEMS PROGRAMMER (Software)

Responsible for systems generation, maintenance and development of the SHADOW II teleprocessing monitor; back-up programmer on the college's ITEL AS/5-3 CPU. Qualified applicants must have in-depth experience with OS/MVT or SVS/HASP systems programming and with IBM 3270, SHADOW II, CICS or other major teleprocessing package. Bachelor's degree in appropriate field from an accredited institution and five years experience or an equivalent combination of education and experience. Salary competitive. Liberal employee benefits. Submit detailed resume including salary requirements to Personnel Services, Miami-Dade Community College, 11011 S.W. 104 Street, Miami, FL 33176. An Equal Access/Equal Opportunity Community College.

PROGRAMMERS PROGRAMMER/ ANALYSTS

Let us offer you our professional expertise in finding the "right" position and company. Our individualized search will provide you with local and national exposure depending on your geographical preference. If you have at least 2 years experience in programming, send your updated resume, geographical preference, and salary requirements in strictest confidence to:

SEARCH E.D.P., INC.
Suite 25

3181 Linwood Rd.
Cincinnati, Ohio 45208

PROGRAMMERS

L'EGGS PRODUCTS, INC., an operating unit of the Hanes Corporation, has immediate openings for Programmers in its Winston-Salem, North Carolina headquarters and in its Atlanta, Georgia Data Processing Center.

Successful candidates will have a minimum of 1-2 years programming experience in COBOL, preferably on Honeywell 6000 utilizing TSS.

We offer a competitive salary and benefits package and the opportunity for professional growth with a dynamic, growing company.

Reply in Strict Confidence, INCLUDING SALARY REQUIREMENTS and LOCATION PREFERENCE to:



Fritz Morrison
L'EGGS PRODUCTS, INC.
P.O. Box 2495;
Winston-Salem, N.C. 27102
Affirmative Action Employer

CSC PROGRAMMER ANALYSTS

Let's Talk About Your Future With CSC's SYSTEM SCIENCES DIVISION

Naturally, you are seeking an opportunity that will capitalize on your education, training and experience . . . a dynamic position that will offer a steady flow of career-building assignments that challenge the best that's in you.

You'll find all this and more with CSC's System Sciences Division where we are deeply involved with several projects for which we are seeking skilled and imaginative Programmer/Analysts. One is an FAA assignment to develop and implement Air Traffic Control Systems; the others are in support of NASA projects . . .

AIR TRAFFIC CONTROL SYSTEMS

We are seeking experience on IBM 360/OS or Minicomputers (XDS-Sigma series preferred) in any one of the following areas:

- Simulation/modeling of air traffic patterns. Knowledge of JOVIAL a plus
- Design and implementation of data base management systems
- OS/360 System generation and maintenance
- Diagnostic design, development or enhancement and hardware orientation
- Software test and validation including development of tools to test and validate real-time software systems
- Software Quality Assurance
- Performance Analysis & Modeling
- Human Factor Studies (N.J. only)

Assembly (BAL) and/or high level language (preferably JOVIAL) highly desirable.

Positions are available in Atlantic City, New Jersey or Jacksonville, Florida.

SPACE SCIENCES

Current positions in support of our Goddard Real-Time System, Spaceflight Tracking Data Network and On/Off Site Project for the NASA Goddard Space Flight Center require a degree in Computer Science, Math, Physics, Astronomy, Meteorology or Engineering with experience using FORTRAN and/or Assembly languages on large-scale or mini-computers. These skills will be applied in the following concentrations:

- Telemetry application with multi-computer configuration
- Integration and testing of real-time display software
- Data base management
- Real-time scientific applications
- Network management
- Computer-to-computer communications
- System requirements definition
- Analysis and application of climatological data
- Simulation/modeling of real-time systems
- Optical Analyst (MS, PhD-Physics or Astronomy)
- 360/370 OS systems programming

CSC offers a liberal relocation policy in addition to a complete benefits package. For immediate consideration, please send resume or call:

Staffing Department

Toll Free: 800-638-0842 Or Call Collect: (301) 589-1545

COMPUTER SCIENCES CORPORATION

System Sciences Division
8728 Colesville Road
Silver Spring, Maryland 20910

Major Offices And Facilities Throughout The World

An equal opportunity employer

EDP OPPORTUNITIES

Blue Cross/Blue Shield of North Carolina has immediate openings, due to increased business, for top data processing professionals.

EDP AUDITORS:

Primary responsibility is the ongoing review of EDP activity to evaluate and report on the adequacy of internal controls in existing and proposed systems. IBM environment. On-line and off-line applications and data base files. One year minimum experience. Salary range to \$18K.

PROGRAMMER ANALYSTS/SYSTEMS ANALYSTS:

Minimum of two years' COBOL programming experience preferred. Exposure to on-line systems in an IMS data base environment a plus. Operating under OS/VS; IBM 370/165. Salary range: \$14K-\$20K.

SYSTEMS PROGRAMMERS:

Teleprocessing specialists with minimum three years' experience. Thorough knowledge of OS Assembler Language. Any of the following desired:

VTAM	IBM 3705 HARDWARE
NCP/SDLC	IBM 3790 HARDWARE
PEP	IMS/VIS
BTAM	

Salary Range: \$14K-\$20K

These positions are located in our North Carolina home office near beautiful Chapel Hill, N.C. Excellent company benefits and growth potential for career advancement.

Please submit resume, including salary history to:

**Blue Cross/Blue Shield
of North Carolina**
Attention: Personnel Manager
P.O. Box 2291
Durham, N.C. 27702
Equal Opportunity Employer M/F

Grow with Amdahl and be a part of the future. Software Opportunities

Are you good at diagnosing system level problems? Amdahl needs...

FIELD SUPPORT REPRESENTATIVES

You should be able to work on your own in the resolution of complex system level problems encountered by Amdahl users. You should have good MVS internals experience plus expertise in one or more of the following components or subsystems:

- VTAM/NCP
- VSAM
- JES3
- TCAM/TSO
- IMS
- CICS

We also have a very limited number of positions available for those select few highly motivated, technically inquisitive application programmers seeking a career in systems programming. Prerequisites are total proficiency in ALC plus one higher level language and a good knowledge of the relationship between major components of an IBM virtual SCP. Current openings are in the San Francisco Bay Area.

Can you accept the challenge of creating an error free system? How: by building test cases that really put all operating system components through a real test. If so, Amdahl needs you as a...

SOFTWARE QUALITY CONTROL SPECIALIST

to generate, apply and verify VS1, SVS, VM or MVS software and material distributed to our Amdahl customers. You should have a close working knowledge of the VS1, SVS, VM or MVS operating system internals, utilities, SMP and assembler language. Current openings are in the San Francisco Bay Area.

Can you build a better mousetrap? Amdahl needs...

SOFTWARE SYSTEMS MAINTENANCE SPECIALISTS

to create all Amdahl SCP maintenance materials. You should possess a detailed knowledge of the VS1, MVS, VM or SVS operating system internals as well as a good working knowledge of utilities, SMP and assembler language. Current openings are in the San Francisco Bay Area.

Do you enjoy customer contact? Amdahl needs...

FIELD SYSTEMS ENGINEERS

at customer locations. You need the ability to handle problems encountered on a daily basis in a large commercial data processing environment. You should have good diagnostic expertise in VS1, SVS, VM or MVS and the ability to be a jack-of-all-trades. Currently there are several openings throughout the United States.

Do you enjoy traveling? Amdahl needs...

HEADQUARTERS SYSTEMS ENGINEERS

to work with Field Systems Engineers at customer locations solving difficult problems. You will also assist customers and Field Systems Engineers in the complex area of system performance and tuning. You should have very good diagnostic techniques and MVS, VS1, VM or SVS internals experience. Current openings are in the San Francisco Bay Area.

Have you been active in recent MVS conversions? Amdahl needs...

MVS CONVERSION SPECIALISTS

to work closely with Field Systems Engineers and Amdahl customers converting to MVS. You should have several years' MVS internals and externals experience, as well as either JES2 or JES3 expertise. Opportunities available for extended travel. Current openings are in the San Francisco Bay Area.

Do you enjoy teaching? Amdahl needs...

SYSTEMS ENGINEERING INSTRUCTORS

to teach MVS or JES3 classes for our Field Systems Engineers. You should have current experience teaching MVS or JES3 internals. Current openings are in the San Francisco Bay Area.

ASP/JES3

Amdahl is looking for people with detailed knowledge of ASP or JES3. Opportunities exist in many functional areas of system programming. Current openings are in the San Francisco Bay Area and throughout the United States.

ACP

We are building our team to support those customers who utilize this specialized high performance DB/DC system. You must have an intimate knowledge of CP internals and be well versed in the application as well. Current openings are in the San Francisco Bay Area.

Send your resume to Phil Beckhlem, Amdahl Corporation, Department A01, 1250 East Arques Avenue, Sunnyvale, CA 94086, or call Tony Price collect at 408/735-4500 between 9:00 AM and 5:00 PM. We are, of course, an equal opportunity employer.

amdahl

V
1
1
3
8

S
E
P

1
9

7
7
UMI

position announcements				
------------------------	------------------------	------------------------	------------------------	------------------------

COMPUTER SYSTEMS ANALYST-MEDICAL

Responsible for design, implementation and coordination of hospital computer applications for an IBM System 370/145 at the University of South Alabama Medical Center Hospital in Mobile. All hospital programming personnel will be responsible to this position. College degree and 3 years' of progressively responsible experience in hospital systems analysis required. Experience with DOS/VIS and CICS/VIS desired. Gulf Coast location. Excellent benefits package. Salary commensurate with experience. Apply by resume only to:

Office of Personnel Relations

UNIVERSITY OF SOUTH ALABAMA

307 University Blvd.
Mobile, Alabama 36688

An Equal Opportunity Employer M/F

SENIOR PROGRAMMER/ANALYST

An expanded range of business and manufacturing applications coupled with the progressive technical environment of an innovative leader in the chemical processing industry makes this an outstanding opportunity for the Programmer/Analyst seeking to step up to Senior level responsibilities.

Working within the frame work of our digital equipment PDP-11 RSTS/E system, you'll participate in systems analysis, program design, coding and other programming tasks; BS in computer science or math and an exposure to interactive on-line applications would be considered essential for success.

Competitive salary, full benefits and extensive opportunities for career advancement accompany this position with our dynamic team DP professionals. For confidential consideration, forward resume with earnings history to:

William Stephan
Staff Personnel Administrator
P.O. Box 1123
Dayton, Ohio 45401



CHEMINEER, INC.

Equal Opportunity Employer M/F

data processing PROGRAMMER/ANALYST

Foremost Insurance Company is the leading national mobile home and recreational vehicle insurer, with corporate offices located in Grand Rapids, Michigan. Our office complex is located in a picturesque suburban area with many excellent residential facilities available nearby. Grand Rapids has most of the advantages of a large city plus many recreational activities for after work and weekend enjoyment.

We have ultra modern facilities and up-to-date technology utilizing IBM 370/158, OS/VISI, ANSI COBOL, with interactive programming. We are staffing for major development projects to begin this fall. Several openings exist in the following areas:

PROGRAMMER I

The candidate must be able to write efficient and maintainable program modules from detail design specifications.

PROGRAMMER II

Candidate will be responsible for the writing of difficult or critical program modules plus translation of system requirements into program specifications. Will assist the project leader in providing functional guidance.

SYSTEMS ANALYST II

The applicant must be able to work well with user personnel, determine needs, define alternative solutions and develop conceptual and detailed system specifications. Will be required to assist in the management of the project.

Previous experience with top down design, structure programming, data base and insurance would be a plus. Opportunities for personal growth are excellent. Foremost offers a complete insurance benefit package plus tuition reimbursement, vacation and profit plan, with an excellent starting salary. Send resume with salary requirements to B. Jourdan, Professional Placement.

CALL COLLECT TODAY
Sunday 9/11 10 am-4 pm or Mon thru Fri 8 am-5 pm
(616) 942-3311 or (616) 942-3262

foremost
INSURANCE COMPANY

P.O. Box 2450
Grand Rapids, Michigan 49501
An Equal Opportunity Employer M/F/H

We're Staffing for a Major DP Expansion

We're W.W. Grainger, a rapidly growing distributor of electrical motors and equipment and are currently taking major steps to expand our IBM 370/158 OS/VISI installation using CICS to meet current and future business demands. Accompanying this growth is an ambitious plan for new systems development offering unlimited opportunities for professional and technical betterment.

Systems Analyst

A degree coupled with a 3-5 year background in accounting systems that documents achievements in project leadership is essential. Strong interpersonal skills are a must.

Programmers

Openings exist for Senior and Junior Level Programmers as well as Programmer Analysts. Proven ability in COBOL programming is mandatory. Any exposure to OS, JCL, CICS, or BAL would be helpful. Some college is desired.

Software Manager

This position requires 5 or more years in supporting operating systems through internal specification and a proven track record in supervising the software function. This key management position calls for strong leadership skills and the capability to interface consistently with top management.

Software Analyst

This position requires 2 or more years working with either OS/VISI or CICS/VS internals. A history of achievements as a member of a software group is essential. Professionals who join the Grainger team will find a highly technical and secure environment where individual contribution is quickly recognized and rewarded. Offered are excellent starting salaries and comprehensive benefits including profit sharing.

If you're interested in taking a closer look at our advanced state-of-the-art installation, we invite you to apply. Send a resume or a brief letter outlining your background in confidence to:

Data Processing Manager — Office D-2

W.W. Grainger, Inc.

5959 W. Howard Street
Niles, Illinois 60648

An Equal Opportunity Employer M/F

W.W. GRAINGER, INC.

data processing

SYSTEMS PROFESSIONALS

First Federal of Chicago, the Midwest's largest savings and loan association, with a strong and continuous pattern of growth, is actively seeking systems professionals to develop new financial systems in conjunction with its dynamic management team. Our operating environment consists of a 370/158-370/145 operating under OS/VISI/CICS driving a teleprocessing network of 250 on-line real-time terminals (and growing).

LEAD PROGRAMMER

For consideration, you will need a 2-3 year background as a programmer analyst or senior programmer, heavy experience in BAL and a working knowledge of COBOL, CICS and OS training. Any on-line real-time teleprocessing experience would be a plus. Primary emphasis will center on your interest in taking up professional project supervisory responsibilities as a lead programmer.

PROGRAMMERS

We wish to provide applications programmers with an opportunity to further develop and enhance their EDP backgrounds thru company-sponsored training on CICS. Programming requirements are 1-2 years BAL and OS expertise. Experience in an on-line real-time environment a plus. Major emphasis will be placed on new systems development.

In return for your technical know-how, you'll be additionally rewarded with an excellent starting salary that includes a comprehensive benefits package. Forward resumes in confidence, including salary history, to:

Manager/Employment

FIRST FEDERAL OF CHICAGO

P.O. Box 4444

Chicago, Illinois 60680

An Equal Opportunity Employer M/F



First Federal of Chicago

position announcements

**MANAGER OF
ACADEMIC SYSTEMS
AND PROGRAMMING**

The University of Akron is seeking a Manager of Academic Systems and Programming who will support the Academic community in computing. The Manager reports to the Director of Computer Services and supervises seven full time computer analysts. The person we seek will have a Master's Degree in a computer-related area, and at least five years of technical experience in scientific applications. The ability to present himself/herself to all members of the academic community, discuss problems and propose solutions is a must. The position requires supervisory, technical and administrative expertise. The University supports a combined academic and administrative Computer Center with an IBM S/370-158 model III running under SVS. Time-sharing with APL, CAI, and CICS is provided to the University community.

If you are the person described above who can plan, organize, supervise, and work well with people, please submit your resume with salary history to:

Mr. Frank Thomas, Director of Computer Services, The University of Akron, 302 E. Buchtel Avenue, Akron, OH 44325.

An Equal Opportunity Employer.

**Programmers/Analyst**

aci... offering top salaries, excellent benefits, and a constant challenge in a multi-faceted environment encompassing virtually all hardware, software, languages, and applications. Call us collect and find out what we're all about.



automation consultants, inc.
1700 needmore road, dayton, ohio 45414
(513) 278-4861
an equal opportunity employer m/f

DIRECTOR DATA PROCESSING

Class I Carrier seeks experienced Data Processing person to manage Systems & Computer facility which is an integral part of successful trucking operation. Requirements are:

- Minimum of two (2) years in general commodity trucking environment.
- Degree in Computer Science or other appropriate and equivalent experience.
- Significant experience in System Design & Management.
- Solid experience managing Computer Operations.

To explore joining a profitable truckline, send resume and salary history in confidence to:

**RECRUITING CONSULTANT
WATKINS MOTOR LINES**
P.O. Box 1636, Lakeland, Fla. 33802

We can give you 3 good reasons to call Robert Half for data processing positions:

1. Robert Half has been in business for about 30 years. Can you name an EDP personnel service that's been around longer?

2. Robert Half specializes. We've been an integral part of the data processing community through all its generations.

3. Robert Half's offices are staffed by experts in the EDP field.

and if 3 reasons aren't enough, we can give you 55 more:

55 offices. Robert Half is a network throughout the U.S., Canada and Great Britain. One call and you've searched the local market...or the world.

and if 58 reasons aren't enough, we can give you Half a reason more:

Robert Half. Where integrity is a lot more than just HALF.



Look in the white pages.

1

ADVANCED
TECHNICAL
DIVERSIFI-
CATION

2

PROFESSIONAL
GROWTH

3

OUTSTANDING
CAREER
PACKAGE

Engineers – Software Design**3 Reasons Why You Should Look Into the Career Opportunities at GTE Automatic Electric!**

Career challenge: the opportunity to make significant contributions at the beginning of a new era in a major industry.

The technical evolution in telecommunications is underway. We're working in many areas of software design in an on-line, real-time environment. Definition, design and implementation projects include CAD, Data Base Systems, Simulation, Fault Recovery, Diagnostics, and very complex switching networks using distributed control system technology. These are the forerunners of even more advanced systems that will be designed for the next generation.

SOFTWARE DESIGN

We're looking for an indepth background in the development of systems software and a minimum of 3 years' experience in structured design, testing and documentation of programs running on large data base, multi-file systems in real-time. Familiarity with HIPO design documentation, TSO usage and software simulation techniques as well as PL1, Fortran and assembler languages for the 8080 and PDP 11 programming is also important.

COMPUTER AIDED DESIGN

We are looking for an extensive background in the design of CAD/CAM systems and the development of interactive access by the users of CAD/CAM functions. Required is 5-10 years' experience in both hardware and software aspects; DA systems operations, and design, and systems engineering. Your initial responsibilities will include evaluation of existing systems, and working with a project team in the Architectural Planning of a major new system.

MINI-COMPUTER PROGRAMMERS

We have specific assignments available on project development teams responsible for the design implementation of various telecommunication processing systems utilizing mini-computers as the processing element. Responsibilities will include the development of software programs for real-time operating systems as well as unique hardware elements incorporated into the systems.

Call now and let us fill-in more details . . .

CALL (800) 323-1966

In Illinois call (800) 942-0491

Monday thru Friday, from 8 am to 4 pm cdt

If you have current experience in one of these areas, a BS, MS or PhD in Electrical Engineering, Computer Sciences, Math, or other appropriate discipline, let us count out more of the benefits and challenges you receive as a member of the GTE family.

If unable to call, please send your resume to:

Manager of Technical Employment, Dept. 471 A6



**AUTOMATIC ELECTRIC
LABORATORIES**

400 N. Wolf Road
Northlake, Ill. 60164

An Equal
Opportunity
Employer
M/F

V
1
1
3
8
S
E
P
1
9
7
7
UMI

position announcements

position announcements

position announcements

position announcements

position announcements

Programming**DATA BASE
ADMINISTRATOR**

Our growing Information Services Department has an excellent opportunity for an individual familiar with a TOTAL data base system. You should have eight or more years' systems application experience—a degree in Business Administration or the equivalent will be highly desirable.

Your responsibilities will include: designing and maintaining the proper organization of data base, insuring compatibility of coding structures, and preparing and enforcing standards for the use and security of information in the data base.

If you are interested in joining a leading manufacturer of process control instruments and systems offering excellent salary, benefits, and an opportunity for professional growth, please send your resume, with salary history to: Mr. T.J. Haines, Fischer & Porter Co., East County Line Road, Warminster, Pa. 18974. (Suburban Philadelphia).

**FISCHER &
PORTER CO.**

Equal Opportunity Employer

**DATA PROCESSING
PROFESSIONALS**
**With us, it is not only
your career...it's OURS**

Our business is the procurement, distribution, and wholesaling of consumable food and related products. It's a business that we know and in which we excel... where our very ability to function is tied to data processing systems. Our information Systems group functions as an integral part of our management team. They reflect the vitality, expertise, and professionalism of our entire organization. We have such an organization because we learned long ago that if we provided careers for our associates, they would provide the profitability and growth. At Fleming it is not only your career... it's OURS.

PROGRAMMERS

We presently have immediate openings in our Topeka Information Systems information systems group for programmers. Three or more years experience with COBOL in a 370 DOS environment is desirable. We offer challenging work assignments, competitive salary, and excellent benefit package. Send resume and salary history in complete confidence to:

L. McClimans
Fleming Companies, Inc.
P.O. Box 1160
Topeka, Kansas 66601
An Equal Opportunity Employer M/F



Fleming

**PHILADELPHIA
EDP PROFESSIONALS
EXCELLENT OPPORTUNITIES
WITH "BIG 8" CPA FIRM**

Positions in Philadelphia for highly motivated EDP professionals with our Computer Audit Assistance Group (CAAG). Individuals will advise and assist in audits of clients using computers.

REQUIREMENTS

- Minimum of 3 to 5 years background in business and financial applications.
 - Proficiency in COBOL, OS JCL and IBM 360/370 operations (dumps, utilities, etc.).
 - Familiarity with data base operations (IMS, TOTAL) a plus.
 - Ability to communicate orally and in writing is essential.
- Salary commensurate with experience. Send resume with salary history in confidence to:

CW Box 3163
797 Washington St.
Newton, Mass. 02160
Equal Opportunity Employer M/F

**San Diego opportunity in
advanced-technology
EDP SYSTEMS
DEVELOPMENT**

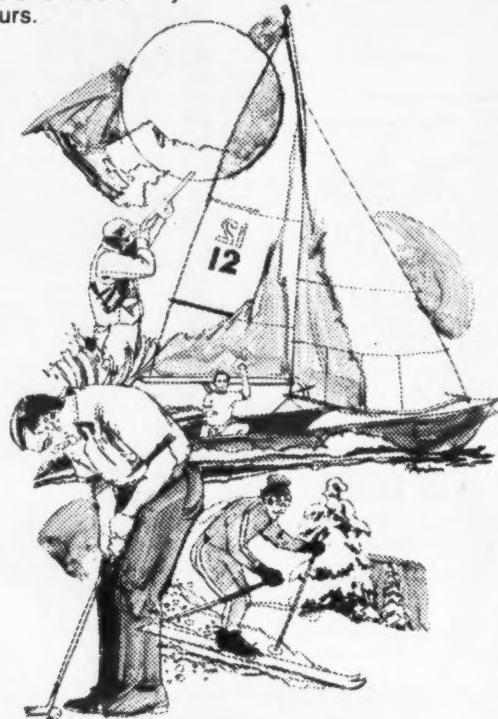
Want to combine the ideal career opportunity with your favorite lifestyle? NCR Special Systems Division needs your help now in developing advanced, high-technology EDP systems for customers around the world. You'll be doing important work in our Sorrento Valley facility, just three miles from the ocean and only minutes from Torrey Pines, La Jolla and downtown San Diego. You can live in the setting of your choice—beach, valley, mountain, country, small-town or urban—and still be only a short drive from work. Spend your leisure hours golfing, swimming, hiking, getting advanced degrees from major universities, attending theatrical, music, art and sports events, or soaking up the year-round sun. Pick your climate, too—from mild coast to dry desert. San Diego is a place of extraordinary choices—and right now the choice is yours.

**COMPUTER
PROFESSIONALS**

The Special Systems Division has opportunities for software professionals in a broad range of disciplines and in all experience levels. Our current and firm future programs require top people with experience in any of the following areas:

- TELECOMMUNICATIONS SOFTWARE
- FILE PROCESSING
- NETWORK DEVELOPMENT
- LARGE MAINFRAME, MINI and MICRO PROCESSOR
- OPERATING SYSTEMS
- COBOL APPLICATIONS
- ASSEMBLY LANGUAGE

Assignments will include the development and implementation of various EDP systems for specific customers as well as the development of future NCR total systems; both requiring state-of-the-art knowledge.



Our benefit package is what you would expect from a major blue chip corporation. What you might not expect is the relaxed and very creative environment of this small, highly specialized division. The facilities are modern, comfortable, designed to provide an atmosphere in which every employee can achieve an uncommon degree of personal and professional satisfaction. May I offer you the opportunity to judge for yourself? Please send your resume (with salary history) to me.

Thom Harris, Employment Specialist

NCR

SPECIAL SYSTEMS DIVISION
4046 Sorrento Valley Blvd.
San Diego, Calif. 92121
We are an equal opportunity employer

New Division Manufacturing

This is the start of a brand new manufacturing division within one of the nation's premier companies. As they do not have enough internal people to staff an entire division they are recruiting:

DIRECTOR \$35K

Experience in management and manufacturing systems, examples: inventory control, warehousing and transport, material requirement planning and process control. Position may include up to 25% travel to Calif. & N.J. Relocation will be paid to NYC.

SYSTEMS ANALYSTS

With a background in OS COBOL and manufacturing systems design experience. Positions entail less travel than the director. Will relocate.

PROG. ANALYST to \$19K

With a strong knowledge of OS COBOL or BAL, CICS or IMS experience. Internals or applications to \$27K. Contact Jon Kenneth

MALLORY DATA SYSTEMS
120 B'way Suite 3114
NYC 10005 212/964-2060

PROGRAMMER/ANALYST

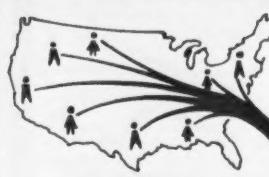
If you have a minimum of 1 year of experience in COBOL, preferably IBM, coupled with a good analytical and systems design background in the manufacturing, marketing and finance areas, then we can offer you some exceptional opportunities working in challenging and rewarding environments. Advancement into pure systems analysis, project management, or involvement in the technical software support side are offered for exceptional performance. A knowledge of D.B. techniques, ALC and a background in TP or VS would be an advantage in certain cases.

For more information call or send resume to:

**CHRISTOPHER AND LONG
E.S.P. DIVISION**

7777 Bonhomme/Suite 1801/St. Louis, MO 63105
(314) 862-9900

position announcements

COMPU SEARCH®

**specializes
in careers
for you...**

See us in your city

Since 1968, CompuSearch has sought out exceptional individuals with data processing related skills for large and small companies throughout the United States. We also have been very successful in locating challenging new positions for thousands of people who have requested our assistance. If you are a talented achiever interested in learning about situations that will best meet your goals, contact our office nearest you in complete confidence. We keep a close watch for the best available opportunities locally and nationally.

Arlington, TX (817) 469-6161
Atlanta, N.W., GA (404) 955-2785
Boston, MA (617) 262-5050
Buffalo, NY (716) 852-5520
Charlotte, NC (704) 535-5220
Cincinnati, OH (513) 651-5500
Columbus, OH (614) 436-3200
Dearborn, MI (313) 336-6650
El Paso, TX (915) 578-9411
Fayetteville, NC (910) 482-2255
Indianapolis, IN (317) 289-2261
Kinston, NC (919) 527-9191
Lansing, MI (517) 694-1157
Los Angeles, CA (213) 930-1313
Louisville, KY (502) 456-4330
Milwaukee, WI (414) 273-4430
Minneapolis, MN (612) 333-8560
Orchard Park, NY (402) 381-8115
Pittsburgh, PA (412) 343-7410
Rochester, NY (716) 245-1660
Sacramento, CA (916) 920-0441
St. Louis
(Clayton), MO (314) 644-5959
San Francisco, CA (415) 362-0911
Southfield, MI (313) 569-2828

COMPU SEARCH®

Division of
Management Recruiters

SYSTEMS PROGRAMMER

University of California

The University of California, Riverside Campus has an immediate opening for a senior level programmer to head up the technical services, systems programming, and user services function. Qualified applicants must have a degree in appropriate discipline with 6 years experience including at least 4 years of systems programming on an IBM 360/370 computer. Thorough knowledge of all phases of the systems programming function; sound experience in FORTRAN, PL/I, COBOL, Assembler, systems generation and maintenance, teleprocessing, and user services essential. Knowledge of BASIC and CAL helpful. Must be able to interface with faculty, staff, and students. Beginning salary to \$24,372 based on experience. Send resume to:

Staff Personnel Office, Univ. of Calif.-Riverside, Riverside, CA 92521. An Affirmative Action Employer.

SENIOR SYSTEMS ANALYST NEW POSITIONS

Work in the Beautiful Northwest
Where Living Is Unhurried, Less
Expensive, and Recreation
Abounds.

Progressive growth organization
plus excellent salary and fringe
benefits.

Marion County/City of Salem
Central Computer Facility serving
local government agencies in four
counties.

Applicants must have experience
in and understanding of total integrated
on-line systems concepts, be able to design, direct, and implement
on-line business systems, plus strong programming background and good communication skills. Must have a minimum of three years of heavy CICS experience, DOS/VIS or OS experience. A minimum of five years increasingly responsible systems design experience. Distributed processing and data base experience desirable. Software: DOS/VIS, Cobol, CICS, Panalet and Easytrieve. Equipment: IBM 370-138. 1-MEG.

APPLY:
Marion/Salem Data Center
690 Ferry St. SE
Salem, Oregon 97301

Software Development Monitor

We have an immediate senior level opening for a person to monitor the status of software development being performed by outside vendors. This position will include technical evaluation of vendor produced specifications, the development of task requirements for outside consultants and the monitoring of software development tasks. This opening requires a high level of technical expertise as well as an ability to relate well to the various consultants. The successful applicant should expect assignments that require some travel.

Applications Programmers

We have immediate openings for real-time assembly language programmers with mini-computer experience. These programmers will be heavily involved in the development of customer software for our users on our Intelligent Terminal Systems. Applications are in areas such as Banking Systems, Data Entry, Airline Reservations and other similar real-time terminal applications. These positions require a minimum of 3 years of experience.

Systems Programmers

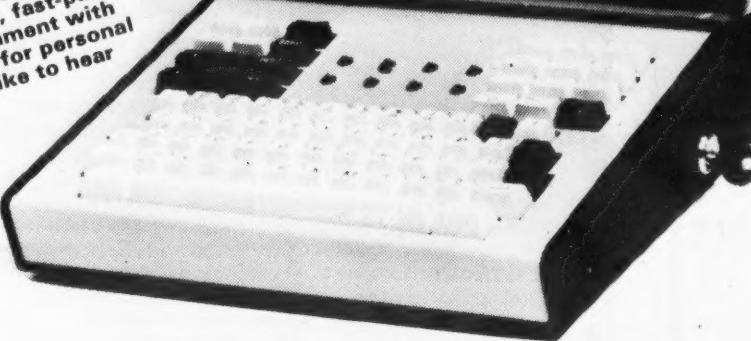
INCOTERM has immediate openings for Systems Programmers to work on our Program Development Systems that are being developed on our PDP-11/70. These are opportunities that will provide in-depth insight into the workings of our systems and will allow for a high level of contribution and responsibility in this system development. Areas in which these programmers will be involved will be cross assembler development, macro-processor development and the general development and enhancement of Programming Development Systems. These positions require a minimum of 3-5 years system experience, and familiarity with the PDP-11/70. Exposure to the UNIX Operating System is highly desirable.

You'll be proud to work for INCOTERM! We turn out a quality product...on schedule...we are leaders...and we've been growing at a phenomenal rate.

STEP UP TO

This is a wonderful time in our history. We've grown big enough to compete with the big guys, but are small enough so that your contribution matters - a lot. If you like a controlled, fast-paced, exciting environment with plenty of room for personal growth, we'd like to hear from you.

THE QUALITY OF INCOTERM



New Product Development

If you need to take charge and be given the opportunity to develop new computer systems the way it should be done, come and talk with INCOTERM. We need experienced, prolific, innovative technical leaders who want to immediately begin work on new product development. Skeptical because all growth-oriented companies are doing research and development? That's true, but at INCOTERM we have unique opportunities that may be just what you need in the way of professional satisfaction. Interviews with technical staff and the Personnel Department will be available at times convenient to you, any evening, and weekends as well.

Operating System Leader

This job entails the successful candidate to lead a small group in the specification, design, code and testing of a contemporary mini-computer sized operating system. Are you an individual who has demonstrated the ability to put together non-trivial systems in an elegant and simple manner (as opposed to non-maintainable complex systems)? We need a strong individual who is willing to take charge in the building of an operating system.

Language Group Leader

The successful candidate will be responsible for leading a group developing high-level language compilers, symbolic debuggers, assemblers and linking loaders. Proven compiler writing experience in block-structured languages such as PL/I is necessary.

Application Support Leader

This is a multi-dimension position whose bottom line is programmer productivity. The responsibilities of the job are two-fold: oversee the specification and construction of application-support tools from memory dumps to data base, and oversee the development and execution of programming methodology. Extensive experience with end-users data base, distributive processing, minis and intelligent terminals a plus.

Firmware Coder

This individual will probably have a BSEE and is becoming more and more interested in programming. The job will be to code the firmware, i.e., the ROM state machine, for a new central processor. The job requires a super-competent, intelligent person who strives for perfection, can spend days squeezing a single line of code out of 200, and has both hardware and software savvy. The successful candidate may not be experienced in this area, but feels he has the qualifications for the position.

Verification

The successful candidate will assist in the testing and verification of INCOTERM software and documentation to assure compliance with specifications. Experience in testing and verifying software is desirable as is a mathematics background.

Senior Software Writer

This is a ground-floor opportunity to start the preparation of documentation during the development stage! In the beginning the successful candidate will assist in the development of internal specifications and other documents for an advanced computer system development. Required qualifications include experience in software oriented technical writing.

Diagnostic Programmers

Experienced Diagnostic Programmers are needed to provide quality software support in development of off-line and on-line diagnostic test programs.

We offer a most competitive compensation plan and an outstanding benefit program.

INCOTERM CORPORATION is a leader in the development and manufacture of "intelligent" computer display terminals.

Please send resume to:

R. W. Van Ness
Corporate Director of
Industrial Relations

INCOTERM
CORPORATION

...the international computer terminals people

65 Walnut Street
Wellesley Hills, MA 02181

an equal opportunity employer m/f

position announcements

position announcements

position announcements

position announcements

position announcements

COMPUTER CENTER DIRECTOR

Clemson University is seeking a Computer Center Director to be responsible for academic, administrative, and contract computing services. The director is responsible for the host computer facility (IBM 370/165-II under MVS) as well as local and remote terminal networks. The director will maintain computing facilities at a state-of-the-art level to support research and instructional needs as well as maintain maximum system availability for production support of statewide online systems. The director reviews and coordinates computer resource needs with two directors of application programming divisions which serve on-campus departments and off-campus agencies. The Director supervises managers of computer operations, software systems, hardware systems, and academic computing services. Minimum qualifications include five years experience in data processing management. Salary negotiable and commensurate with qualifications. Submit three letters of reference relevant to technical and management qualifications and complete resume to:

Search Committee, Computer Center Director, c/o Graduate School, E-106 Martin Hall, Clemson University, Clemson, S.C. 29631. Closing date for applications is Oct. 31, 1977. Clemson University is an equal opportunity, affirmative action employer.

Senior Programmers

Due to company growth we are expanding our Data Systems activities. Responsibilities include applications programming in a number of systems areas utilizing our COBOL-based Main System and our various minicomputer-based systems.

To qualify you should have a computer science degree and a minimum of two years programming experience in a COBOL environment. These interesting positions will offer you career growth along with a good starting salary and fringe benefit program.

If you are interested in joining our team of professionals, send your resume and salary history in complete confidence to:

Gail McGuire

Material Service Corporation300 W. Washington
Chicago, Illinois 60606
*equal opportunity employer m/f***PRODUCT CONSULTANT**
Product Marketing

Harris Data Communications Division has an opportunity NOW for an individual with a minimum of 3 years field sales experience in data communications hardware or software, plus marketing staff experience and a high degree of analytical skills.

The individual will be responsible for competitive analysis, short and long range planning, recommendations for product enhancement and assistance to field marketing and sales support. This position also provides interface for product development and market support.

You will be joining the marketing staff of one of the TOP companies in the industry, and will work with TOP communications specialists in a highly technical environment.

We offer a competitive salary, comprehensive company benefits and a dynamic atmosphere in which to grow and prosper.

For prompt consideration, please send resume with salary history to: TOM BRYAN at: Harris Data Communications Division, P.O. Box 44076, Dallas, TX 75234


HARRIS
COMMUNICATIONS AND INFORMATION HANDLING
*An Equal Opportunity Employer M/F***Join the TI Minicomputer Team**

Texas Instruments is seeking highly motivated and creative individuals in its rapidly growing Digital Systems Division in Austin, Texas. Selected individuals will join the 990 minicomputer team which is one of the new thrusts of the corporation. You'll enjoy life in Austin — one of the fastest growing major cities in the U.S. It's got the kind of riches every city wants. Beautiful lakes and hills. The South's largest university. Outstanding parks and public schools. And Texas has no state income tax. Join Texas Instruments — a name synonymous with technological achievement and product reliability.

System Analyst/Project Leader

Develop software for the exciting 990 Computer Family. Performing functional systems design of Software Projects. Requires implementation of operating systems, data communications, languages, data management and utilities. Will assume project management status after initial training and performance period. Aptitude in assembly language required. Familiarity with PASCAL desirable. BS or MS in Computer Science, mathematics, physics, or engineering with 4-10 years' experience.

System Software Designers

Take a career jump into the TI minicomputer software team. Duties will include the design and development of extensive systems level diagnostics software for 990 computers in a stand-alone and real-time environment. Excellent knowledge of assembly language programming, diagnostic software and digital logic design required. BSEE with computer science background and 3-7 years' related experience.

Product Marketing Engineer

A real opportunity to conduct market analysis and definition for minicomputers and intelligent terminals. Duties will expand to include writing new product marketability specifications, preparing business plans, competitive analysis and making pricing recommendations. Also, responsibilities will include some sales training regarding market analysis and new product strategies. Requires comprehensive knowledge of intelligent terminal/minicomputer business with related experience in product planning. Requires BS/MS in Computer Science with BA/MBA or related business experience.

In Austin, Texas**Marketing Applications Engineers**

Work in the forefront of new product development at TI. Duties include analysis of customer requirements and systems design. Direct daily communications in advising and counseling current and potential customers in TI's new distributed processing product lines. Individual will also develop demonstration packages and provide general technical and new product support. Software background, knowledge of digital communications and 3-7 years of directly related experience required as well as BSEE, Computer Science or related technical degree.

Product Planner

Duties would include product/marketing analysis for specific opportunities, conducting competitive analysis, developing specific marketability specifications and communications to management. Requires a BS in Engineering with an MBA preferred, and 4-7 years' experience with 2-5 years in the minicomputer or data processing industry.

Product Services Engineers

A career development opportunity in the support of new computer products from conception to field maturity. Duties will require coordination of service planning-maintenance philosophy, spares requirements, tooling, RMR, training and field installation and sustaining product until field and product reach service maturity by product and/or by account. Similar responsibility will include policy development for product maintainability, serviceability and test design. BSEE with a minimum of 2 years of design or sustaining of minicomputers or related peripherals.

Technical Writers

Experienced digital hardware and software technical writers are needed to join in the development of TI's rapidly growing minicomputer business. Electrical Engineers and computer programmers with good writing skills should also apply.

Send resume in complete confidence to: Lee Cooke, Staffing Manager/P. O. Box 2909, M.S. 2106/Austin, TX 78769.

TEXAS INSTRUMENTS INCORPORATED
*An equal opportunity employer M/F***Communications Maintenance Engineers****Minis: Varian, DEC PDP 11, Honeywell**

Join Tymshare — the growth company in Computer Services. Where Opportunity for Experienced Professionals includes:

- Immediate openings in Pennsylvania, Illinois, Texas, California
- Responsibility for installation and maintenance support of all associated network hardware
- Advancement to suit your goals — management, technical, and software

We should get together if you:

- Have experience with any of the above systems
- Served 3-5 years as electronics technician
- Are well-versed in data communications

All positions offer an excellent salary and company benefits. Call us COLLECT immediately or send your resume in confidence to: Mr. Don Johnson, (408) 446-0222, TYMSHARE INC. 10231 Bubb Road, Cupertino, California 95014. An equal opportunity employer m/f.

position announcements	position announcements	position announcements	position announcements	position announcements															
<p>Systems Analyst/Data Base Manager... to participate in the redesign and implementation of a community college data base on new large scale computer hardware. Includes supervision of programming staff in the analysis and design of applications. Requirements: AB Degree/3 years progressively responsible experience in COBOL programming and systems design. Qualifications: Experience in a college or University environment, experience in data communications and RBMS. Salary Range: \$1504-\$1904 Rancho Santiago Community College District 17th Street at Bristol Santa Ana, CA 92706 (714) 835-3000, Ext. 365</p>																			
<p>EDP AUDITOR Organize and implement the full range of EDP audit procedures in a company that has virtually none at present. One year EDP audit exposure may qualify you for this opportunity to build a system from the ground up. Salary area \$29,000.</p>																			
<p>MINI-COMPUTERS Work into the mini-computer field with one or more years experience in any language. Develop systems in a variety of languages on several kinds of hardware. This is a highly interesting position for someone with limited experience. Salary area \$18,000. For further information, contact Connie Hanlon or Tom Fischer at (713) 658-9898.</p> <p>All Fees Assumed by Client Companies M. DAVID LOWE PERSONNEL SERVICES 403 Houston Nat. Gas. Bldg. Houston, Texas 77002</p>																			
<p>DIRECTOR Data Processing Ramsey County is seeking a proven manager to be its Director of Data Processing. The Director heads a 75 member department which uses a CDC Cyber 72 computer and provides services to county departments and to contract users. Current applications areas include Law Enforcement, Property Taxation, Human Services, Budgeting and Accounting and many others. Applicants should have a bachelor's or master's degree in an appropriate technical area or an MBA or MPA, and 10 years increasingly responsible experience in programming and systems analysis, including 4 years in a supervisory or management position. To apply send detailed resume including salary history to: John Johnson, Room 1845, Court House, St. Paul, MN, 55102. Equal Opportunity Employer.</p>																			
<p>SAN FRANCISCO Our client (Major Calif. Bank) needs Systems Analysts/Systems Programmers for S.F. and L.A. locations. Comp. 20-26K. Following experience is of interest: MIS Design, IMS, MICR, OS/MVT, MVS/JES III, ASP, Hdw/Software evaluation, Planning, and forecasting, and MBA. Reply in confidence to: Tinman Walker & Co. Executive Search Consultants P.O. Box 707 Belvedere, CA 94920</p>																			
<p>COMPUTER SCIENCE Faculty-Administrative Position Responsibilities: Administer program in applied computer science; develop curriculum; advise majors; teach programming languages and systems design and analysis. Requirements: M.S. or Ph.D. in computer science, or M.B.A. Start as soon as possible. Rank and salary dependent on qualifications. Credentials to: Dean, College of Continuing Education, ROOSEVELT UNIVERSITY, 430 S. Michigan Ave., Chicago, IL 60605. Equal Opportunity University</p>																			
<p>SUPER PROGRAMMER 25 - 50 K PDP 11/70 RSTS BASIC SYSTEMS MANAGEMENT ONE MAN SHOW STATE PRESENT SALARY REPLIES CONFIDENTIAL CONTRACTORS WEEKLY SEATTLE & PORTLAND BOX 9271 SEATTLE 98109 ATTN: DON (206) 622 7053</p>	<p>ALL FEES PAID IN S.E.</p> <table> <tbody> <tr> <td>Programmer-COBOL</td> <td>\$15K</td> </tr> <tr> <td>Systems Programmer</td> <td>\$20K</td> </tr> <tr> <td>PDP Programmer</td> <td>\$15-20K</td> </tr> <tr> <td>Software Specialist</td> <td>\$21K</td> </tr> <tr> <td>Sales Support</td> <td>\$20K</td> </tr> <tr> <td>Programmer/Analyst</td> <td>\$17K</td> </tr> <tr> <td>Systems/Analyst</td> <td>\$22K</td> </tr> </tbody> </table> <p>Contact Helen Miller, CEC a D.P. Specialist at</p> <p>Dunhill</p> <p>OF COLUMBIA, INC. 4700 Forest Drive • Suite 217 Columbia, SC 29206 (803) 782-9230</p>	Programmer-COBOL	\$15K	Systems Programmer	\$20K	PDP Programmer	\$15-20K	Software Specialist	\$21K	Sales Support	\$20K	Programmer/Analyst	\$17K	Systems/Analyst	\$22K	<p>EDP SALES FIELD SERVICE ENGRS SYSTEMS ENGINEER RAY HARRIS</p> <p>Computers, Peripherals, or Software experience. \$20-30,000+. Tired of no support, Low commissions & high charge backs? Contact Ray Harris for a top career change!!</p> <p>LLOYD PERSONNEL</p> <p>10 Cutter Mill Rd. Great Neck, N.Y. 11021 (516) 466-6670</p>	<p>PROGRAMMER/ANALYST</p> <p>The client, company location and working environment are excellent. The qualified candidate should have a min. of one yr. programming experience. Dynamic IBM atmosphere, excellent salary and benefit package. Other positions available in metropolitan or rural areas. Relocation and fee paid. Contact Rich Haney for more details.</p> <p>ROBERT HALF PERSONNEL AGENCIES 2236 IDS Center Minneapolis, MN. 55402 (612) 339-9001</p>		
Programmer-COBOL	\$15K																		
Systems Programmer	\$20K																		
PDP Programmer	\$15-20K																		
Software Specialist	\$21K																		
Sales Support	\$20K																		
Programmer/Analyst	\$17K																		
Systems/Analyst	\$22K																		

position announcements

position announcements

position announcements

position announcements

position announcements

Systems**PROGRAMMER/ANALYST**

We are seeking a top Programmer/Analyst with 2-5 years of COBOL experience who is interested in joining a progressive department. We utilize state of the art equipment including an IBM 370-158 and employ the project team approach to application development. Our EDP development is among the fastest moving in the retail world and includes the use of:

IMS Batch & IMS On-Line
Electronic Point of Sale Equipment
Remote Data Communications
Large Scale Integrated Systems

As a progressive company, we provide competitive salary along with a top benefit program including major medical health insurance, life insurance, pension, savings & stock purchase plan, employee discount as well as several other options. If interested, Please write or call in strict confidence, Ralph Dostal — (612) 375-3049.



DAYTON'S

700 on the Mall
Minneapolis, Minnesota
55402

An Equal Opportunity Employer.

SYSTEMS ANALYST PROGRAMMER ANALYST

Our expanding Data Processing Division has existing openings for qualified Systems Analysts and Programmer/Analysts in our large EDP development effort.

The individuals we seek will have responsibilities in design, development and implementation of large scale health care systems.

THESE POSITIONS REQUIRE:

- Direct health care related experience
- Solid background in programming and system design
- COBOL programming
- O/S JCL

General knowledge of advanced IBM 370 hardware and systems software, OS/VS1, CICS, VSAM.

We offer the opportunity for diversified experience and rapid growth, along with excellent salary and substantial benefits.

Please call (501) 378-2168 or send a detailed resume and salary history to:

PERSONNEL MANAGER

ARKANSAS BLUE CROSS
AND BLUE SHIELD, INC.

601 Gaines St.

Little Rock, Arkansas 72203
An Equal Opportunity Employer**APPLICATIONS
PROGRAMMER**

Employee oriented software company, a leader in its field of source mgt. library systems seeks a programmer in COBOL with accounting and mgt. info background and some recent IMS exp. Exc. career opp'ty. Co. pays our fee. Send resume to Rich Bruehing, or call (312) 665-4455.

S-H-S INTERNATIONAL
1616 E. Roosevelt Rd.
Wheaton, IL 60187
(Private Employment Agency)

**DATA PROCESSING
SPECIALISTS**

Major nationwide clients offer challenging E.D.P. situations. Below is a partial listing.

Prog. Cobol, PL-1	15k
Prog/Analyst	22k
Sys/Prog. OS Dos	25k
Sys/Consult.	28k
Sys/Analyst	25k
Mkt. Rep.	30k

These positions are client paid and all replies will be held confidential. For a quick response send a current resume or call (Jim) (412) 734-0920.

S.A. MORTELL ASSOC.
700 California Ave.
Suite 204
Pittsburgh, PA 15202

**SENIOR
PROGRAMMER
ANALYST**

Shuron Textron, a rapidly growing leader in the manufacture of prescription optical products, is seeking a strongly motivated senior programmer analyst with in-depth knowledge of COBOL and BAL. Must have 5 yrs. experience preferably in a manufacturing background. Experience with CICS, DBMOP or TOTAL is a highly desirable. We are presently operating under IBM 360/30 DOS but will be converting to IBM 370 in the near future.

Excellent salary and benefits program with opportunity for personal growth in the professional environment of our corporate offices in Rochester.

For immediate, confidential consideration, send resume including salary requirements to:

MR. I.W. GROWE, Personnel Manager

SHURON TEXTRON

Shuron Division of Textron Inc.

P.O. Box 331, Rochester, N.Y. 14601
An Equal Opportunity Employer (M/F)

**SYSTEMS PROGRAMMERS &
SENIOR SYSTEMS ANALYSTS**

If you're seeking a challenging career in communications software, consider

**NCR's
Communication Systems
Division**



NCR's Communication Systems Division, specializing in the development and manufacturing of data communications products and systems, is currently expanding its COMMUNICATIONS SOFTWARE group.

Get in on the ground floor of advanced communications design and participate in NCR's entry to DISTRIBUTIVE NETWORK ARCHITECTURE consisting of a series of microprocessor-based terminal systems and node connected by communications lines.

We are looking for key individuals who have indepth software background with solid communications experience. Qualified applicants must provide definition, design and implementation leadership, and have experience in any of the following areas:

- Microprocessor software (assembly level)
- Communications links disciplines (SDLC, bisynch, ISO, etc.)
- Front end processor software
- Network node software
- Network definition language (system generator)
- Constructors for nodes, cluster controllers, and front ends (COBOL)

All our positions are in our beautiful, sunny South Carolina location, close to the seashores and mountains. Columbia offers a lifestyle that includes both city and country living with excellent recreational facilities for tennis, golf, fishing, boating and swimming. The area also offers excellent housing opportunities, low taxes, and it is the home of the University of South Carolina and other fine educational institutions.

If you are seeking a challenging career with a leader in the industry, need a new lifestyle and have the above experience, we'd like to speak with you.

A degree in Engineering, Math or Computer Science is required. For consideration, please send your resume and salary requirements in complete confidence to:

NCR

Ken Unlig, Dept. CS
Industrial Relations
Communications Relations Div.
NCR Corporation
3325 Platt Springs Rd.
West Columbia, S.C. 29169

An Equal Opportunity Employer M/F

**Computer Sales/Support
Professionals:****THE
SEARCH
IS ON**

For detailed information, please see our ad on page 66 in the main news section of today's paper.

An Equal Opportunity Employer M/F

**THE
SEARCH
IS ON**

Honeywell

position announcements

position announcements

position announcements

position announcements

position announcements

SYSTEMS PROGRAMMERS

San Francisco Bay Area

Continued high technology growth at ESL has created exciting new positions for Programming Professionals.

Requires 5 years IBM 370/OS experience in a scientific or engineering environment including OS or VM/CMS internals, JCL and Assembler. Additional experience in the following areas desired:

- * Interfacing minicomputer or microprocessor to host IBM systems;
- * IBM communications experience with 2701, 3704 or 3705 hardware & software;
- * Knowledge of APL, COBOL, PL1 & Fortran. Experience with debugging & software optimization techniques. Exposure to data management & scientific data processing applications essential;
- * Graphics software packages.

BS in Computer Science, Math or Physics required.

Take advantage of this opportunity to join ESL, an acknowledged leader in the field of communications, reconnaissance and data processing systems.

Please send resume, including salary history, to Arva Jost, Professional Employment, ESL Inc., 495 Java Drive, Sunnyvale, CA 94086. An equal opportunity employer. U.S. Citizenship required.



ESL offers excellent salary and benefits including cash profit sharing and company paid Medical/Dental Plans.

SYSTEMS PROGRAMMER PROGRAMMER ANALYSTS (3)

• SYSTEMS PROGRAMMER

minimum 1 year experience with IBM 360/370, ALC, systems generation, VM/370, VS/1, teleprocessing, and minicomputer experience helpful. College degree preferred. 18-20K

• PROGRAMMER ANALYSTS

1-2 years COBOL programming essential. Familiarity with PL1 and/or MUMPS helpful. Experience in a University environment preferred. College degree preferred. 12-15K.

We offer challenging positions in a progressive DP department using VM/370, CMS, and VS/1 on an IBM 148. Also, DEC PDP 11/45, 11/10 under Mumps. Fringe benefits include free tuition program. Forward resume, including current salary to

Ines Kerch, Administrative Officer
Georgetown University

Ryan Administration Bldg., Washington, D.C. 20057
EEOC/Affirmative Action Employer

TEXAS-FLORIDA SCIENTIFIC PROGRAMMER

2-5 years programming experience in 16-bit mini-computers using Assembly language. Experience should emphasize program development, design and analysis for real-time process control systems. Prior experience on the following computers is desirable: PDP 11/40, HP 2100, INTERDATA 7/16, Varian. Salary to \$23,000. All interview, relocation and our fees paid.

Resumes to Jack Andrews
ABACUS
Personnel Consultants
2882 Forest Lane
Dallas, Texas 75234

Programmers

Now have IBM 135 DOS-VS and are tooling up for IBM 138. New systems, programs and software. Challenge and opportunities are yours. Minimum 1 plus years of ANSI COBOL. Casualty experience a plus.

Salaries commensurate with experience. Send resume including salary history and requirements to: Personnel Department.

GNY Insurance Companies
646 Route 18
E. Brunswick, N.J. 08816
Equal Opportunity Employer M/F

COMPUTER

PENNSYLVANIA BLUE SHIELD

Join the most sophisticated EDP environment in Central Pennsylvania

At Pennsylvania Blue Shield, we maintain the latest in equipment and pride ourselves on a high level of talent and expertise. To help continue our growth, we're looking for qualified individuals to fill the following positions:

SUPERVISOR, COMPUTER OPERATIONS

Candidate must have at least 5 years experience in a large batch oriented operations environment, with at least 2 of those years in a supervisory capacity. Incumbent will have the accountability of our 3rd shift, with a staff of 6 reporting. Knowledge of OS/JCL is desirable.

COMPUTER OPERATIONS

Several openings exist for individuals with 3-5 years operating experience in a large batch oriented environment. Knowledge of IBM 370 hardware, HASP, CICS, and OS/JCL would be desirable.

Our DP facility is a multi-CPU environment which consists of 370/155 and 370/148 running in an OS MVT mode.

We can offer job security with salary commensurate with skills, ability and experience. Interview and relocation expenses are paid.

Please submit resume and salary history to:

R.J. McCann

**PENNSYLVANIA
BLUE SHIELD**
An Equal Opportunity Employer M/F

Camp Hill
Pennsylvania
17011

WESTERN REGIONAL SALES MANAGER 4-1-1 SYSTEMS

For Telephone Industries

411 Systems, a division of Comshare, Inc., is a leader in the design, development, documentation, and marketing of software systems exclusively for the telephone industry.

Our growth and determination to increase our market penetration has created this outstanding career opportunity for a professional with a proven track record. You must be able to offer a minimum of 5 years' experience in the computer industry, preferably in computer services; plus a minimum of 3 years' experience selling to the telephone industry including thorough understanding of the nature and structure of that industry.

You should be capable of utilizing current technical resources and generating new sales—both horizontally and vertically within an established client base.

SAN FRANCISCO

will be your base of operations with responsibility extending to a branch office in Los Angeles. We offer an excellent salary, full benefits and profit sharing for starters. To apply, send your resume in strictest confidence to: Jules M. Seshens, Director, 411 SYSTEMS DIVISION, COMSHARE, INC., 111 Presidential Boulevard, Suite 219, Bala-Cynwyd, Pennsylvania 19004.

COMSHARE

An Equal Opportunity Employer M/F

ADDINGTON & ASSOCIATES PERSONNEL SERVICES, INC.

WE'RE SELLING HOUSTON!

THE FUN/SUN CITY

Clients Will Relocate.

Corporate Systems & Programming Manager To 45K Major corporation seeks manager of all systems development and maintenance effort. Supervisory experience over forty plus DP professionals required.

Oil & Gas Marketing Systems

To 30K A thorough grounding in Sales/Marketing such as Order Processing, Finished Goods Inventory, Billing, Distribution. Experience with Brandon Applied Systems is a big plus.

Project Manager—Manufacturing

To 24K Favorite client seeks Sr. Systems Analyst to promote to Project Manager. Manufacturing systems design, COBOL, any CPU.

IMS Applications

To 25K Over 15 major Houston Corporations now have IMS! Industries include (Oil & Gas, Manufacturing, Banking, Insurance, Chemical). Language background required is COBOL, ALC or PL1. Hardware IBM 370/OS, DL1 experience is a must.

Systems Software Programmers(2)

To 30K A major energy company needs two internals software programmers with 2-4 years experience in Internals on IBM 370/OS or 370/VS systems. MVS or SVS a big plus.

IMS Data Base Staff Consultant

To 36K Will set IMS standards & procedures and serve as an internal consultant and advisor to IMS users. Must have IBM IMS DB/DC data base administrative to consulting experience.

Data-Com Systems Engineer

To 30K A major company is seeking a person who will design and support a nationwide in-house TPC network. Must be familiar with IBM front-end 3705 NCP w/VTAM environment.

Senior Analyst

To 22K New Orleans client seeks person with IMS/OS banking experience. Relocation paid.

Systems Software

To 25K Houston chemical company seeks strong Systems Programmer to support expanding IBM 370/158 OS TSO environment. Must know IMS. Relocation paid.

ALC Programmers(3)

To 25K Must have 3 years ALC applications Programming with a good knowledge of software on IBM 370/OS/VS systems.

All Fees Assumed by Client Companies

MAIL RESUMES TO: P.O. Box 19547 HOUSTON, TEXAS 77024



ADDINGTON & ASSOCIATES
PERSONNEL SERVICES, INC.

3013 FOUNTAINVIEW SUITE 200

HOUSTON, TEXAS 77057

(713) 780-8810

SCIENTIFIC PROGRAMMER

Los Alamos Scientific Laboratory, a multi-faceted national R&D facility, is seeking a professional with broad experience in FORTRAN programming for scientific applications. The position involves satisfying the software needs of LASL's multi-disciplined Environmental Studies group.

The successful candidate must have the ability to communicate effectively with professionals in other technical disciplines, and to develop codes from descriptions of need from non-programmers. Three years' experience in developing user-oriented software in one or more of the following areas is desired: statistical analysis, computer graphics, scientific data bases, and simulation models. A bachelor's degree in math or computer science is preferred.

The Laboratory, located in the beautiful mountains of northern New Mexico, offers excellent working conditions and benefits, including 24 days' annual vacation and a variety of professional growth opportunities. Los Alamos offers a pleasing lifestyle, with small-town friendliness, abundant recreational opportunities, and an excellent school system. Send complete resume, in confidence, to:



Patricia D. Beck, Recruiting Rep. Div. 77-AS, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, N.M. 87544. AAA/EOE, Women, Minorities, Veterans, Handicapped urged to apply. U.S. citizenship required.

position announcements

DIRECTOR MIS

Leading home entertainment company located mid New York State. New installation of Honeywell 6000 equipment with satellite plants interfacing. Hire own staff. Growth situation.

\$28,000 FEE PAID

ROBERT HALF PERSONNEL AGENCIES
522 Fifth Avenue
New York, N.Y. 10036
(212) 221-6500

IMS FLORIDA

Our Fortune 100 Client seeks IMS "Pro" for its full service data center. State-of-the-art environment includes: dual 370/168's, MVS/JES II, TSO, IMS, COMTEN. Nationwide network transmitting in excess of billion characters daily. Client company assumes all fees including interview and relocation expenses. Similar positions available in 24 states.

5 Sys Progs-TSO/TCAM JES II,
IMS ... \$20-25K
5 Data Comm Spt - COMTEN ...
\$20-25K
15 IMS/VS Prog/Anal
DL-1...\$18-25K
CALL Toll Free-24 Hours
1-800-82-2270 X605
(In, MO. 1-800-892-7655
Bill Denny

JIM KING

438 Gulf Life Tower
Jacksonville, Fla. 32207
Ask for our new free booklet on
effective resume preparation.

RESEARCH PROGRAMMER

The Urban Institute, a private non-profit social science research organization, needs a creative programmer to perform applications systems design, programming, and maintenance.

Individual will extend and improve a large model for socio-economic microsimulation; provide technical assistance and documentation to programmers and research users of the system; and provide related programming and assistance to staff members. Opportunities may exist for participation in economic research.

Experience with interactive computing in a social science research environment is essential, and experience using FORTRAN and assembly language on the DECsystem-10 is desirable. Excellent compensation and benefits program.

Please submit resume and statement of interests to: Employment Supervisor.

THE URBAN INSTITUTE
2100 M St., N.W.
Washington, D.C. 20037
Equal Opportunity Employer M/F

PROGRAMMING SUPERVISOR

Southeastern Wisconsin based system 370 model 138 installation has an opening for an experienced programming supervisor whose duties will include direct supervision of five programmer/analysts responsible for all application software. Some actual coding work may be necessary. Successful candidate will have extensive knowledge of COBOL and RPGII, as well as DOS and CICS experience. Send resume and salary history to the Southeastern Wisconsin Regional Planning Commission, 916 N. East Avenue, Waukesha, Wisconsin 53186. An Equal Opportunity Employer

PROGRAMMER
Manufacturing Data Systems

Pitney Bowes a Fortune 500 leader in the field of Business Communications is seeking an individual with an extensive programming/technical background.

You will be working in a sophisticated environment - UNIVAC 1122 MP, UNIC, DMS-1100, TIP-utilizing state-of-the-art techniques in systems design and implementation. Applicant should demonstrate a proven ability in all aspects of sophisticated data based development, implementation and operations.

Qualified applicant will possess two plus years successful experience in UNIVAC 1100 series systems, ASCII, COBOL (preferably modular) and all other attributes such as data communications and distributed processing.

You will become an integral part of a small, dynamic staff, affording a self starter who can work independently and interface effectively with all levels of management a high degree of visibility and realistic financial and professional gains.

Position offers a truly competitive salary as well as participation in an outstanding benefits program designed for you and your family.

For your prompt consideration, please submit your resume including salary history and requirements in complete confidence to Larry Bohn-Manager of Professional and Technical Employment.



Pitney Bowes

69 Walnut St., Stamford, Conn. 06904
An Equal Opportunity Employer M/F

**SENIOR ANALYST
PROJECT LEADER**

A major Washington communications firm is seeking an experienced Sr. Analyst Project Leader with in-depth knowledge of both structured analysis and programming to participate in several exciting systems development projects. The successful candidate must have 3 to 5 years of analysis experience and recent programming or programming team leader work. Particular applications background in Account Systems (Cost Accounting, Payroll, General Ledger, Marketing Systems and/or Manufacturing Systems) is required. Some experience with distributed systems (stand-alone or on-line data base management systems or the selection and installation of packages software) is very desirable. We offer a highly competitive salary, a dynamic atmosphere and excellent benefits. Please reply in confidence and state salary requirements to:

CW Box 3161
797 Washington St.
Newton, Mass. 02160

**THE
OUTDOORS MAN**

Firm in Mid-state Missouri needs two strong applications COBOL programmers. Degree a plus, but not necessary. Currently using 360/50 with GRASP. Salary to \$18,000

ROBERT HALF PERSONNEL AGENCIES
7733 Forsythe
St. Louis, Mo.
(314) 727-1535

EDP**In the Northwest**

Current openings for systems programmers, programmer analysts, system analysts and project leaders. Salaries \$18K to \$28K. Call Collect:

LARRY LEBLANC
(503) 248-9753

Career Specialists
1703 Main Street
Vancouver, WA 98660

**Programmer/
Analysts****Get On Target With IMS America**

We are the world's largest Medical Marketing Research company, and as such we can offer the dynamic super-achiever in the Data Processing field both the room and responsibility to successfully advance. Expansion has created career opportunities for professional Programmer/Analysts at several levels of skill at our Ambler, Pa. facility.

The successful candidate will be responsible for both the technical and programming support of our research project teams, must be a good communicator and be able to work with a minimum of supervision. Applicants must have a minimum of 3 years experience in COBOL, with BAL PL 1, or Mark IV and CICS an asset. Our hardware/software consists of twin 370/158's, OS/V/S 2, CICS on-line, TSO and PANVALET.

Our salaries and our benefits plan are the most competitive within the industry and will be based on your background and potential. We are conveniently located 1/2 block from the Reading Railroad's Ambler station and 5 minutes away from the Ft. Washington exit of the Pennsylvania Turnpike. Please send your resume to the Manager of Employment.



IMS America Ltd.

Maple & Butler Pike
Ambler, PA 19002
Equal Opportunity Employer

**Third of a Series of Six****PROGRAMMERS and/or ANALYSTS**

We have exceptional opportunities for career growth in general diverse areas.

OS COBOL

- 1-2 years minimum experience, but the more the better
- 1-2 years minimum experience, but again - the more the better

COBOL PROGRAMMERS/ANALYSTS

(In hospital environment)

- Financial experience also useful
- You will be developing software for a new computer line

INTEL 8080**PROGRAMMERS/ANALYSTS****IMS**

COBOL experience useful, but not necessary

If you have expertise in ANY of these fields, you can't afford to ignore this opportunity. Don't hesitate a moment longer, send your resume now

Call us TOLL FREE (800) 543-7583

and judge for yourself the superiority of our salary benefits.

ALLEN SERVICES CORP

DAYTON AIRPORT OFFICE

212 West National Road

Vandalia, Ohio 45377

In Ohio call collect (513) 890-1200

EOE

**Yours
Free!****Call for your copy today!**

Source Edp's 1977 Computer Salary Survey is now available. This authoritative and up-to-the-minute report will allow you to compare your compensation directly with professionals across the country performing the same duties you perform. It also examines in detail the strategies and techniques thousands of successful computer professionals have used to enhance their careers. After fifteen years of recruiting experience, Source Edp knows how you can gain broader professional exposure, maximize your compensation and break into management. It's all in Source Edp's 1977 Computer Salary Survey and career planning guide.

**For your FREE copy, call the
Source Edp office nearest you.****East**

Boston	617/482-7613
Greenwich	203/869-5977
Hartford	203/522-6590
New York	212/736-7445
Philadelphia	215/665-1717
Union, N.J.	201/687-8700
Wash., D.C.	703/790-5610
Wellesley, Ma.	617/237-3120

South/Southwest

Atlanta	404/325-8370
Dallas	214/387-1600
Denver	303/773-3700
Fort Worth	817/338-9300
Houston	713/626-8705
New Orleans	504/561-6000

Midwest

Chicago	312/782-0857
Oak Brook, Il.	312/966-0422
Cleveland	216/771-2070
Detroit	313/352-6520
Kansas City,	
Mo.	816/474-3393
Minneapolis	612/544-3600
St. Louis	314/862-3800
St. Paul	612/771-0544

West Coast

Encino, Ca.	213/995-8866
Irvine, Ca.	714/833-1730
Los Angeles	213/386-5500
Oakland	415/444-5955
Palo Alto	415/328-7155
San Francisco	415/434-2410
Seattle	206/454-6400
Torrance, Ca.	213/540-7500

source edp

If unable to call, write:
Source Edp
Department C-3 1
721 Enterprise
Oak Brook, Illinois 60521

(When writing, please be sure to indicate home address and current position title.)

position announcements

position announcements

position announcements

position announcements

position announcements

in* sight

DISPLAY DATA CORPORATION

Four years ago, Display Data Corporation set out to develop the best in-house computer system for selected industries. The result was "In*Sight", a turn-key mini-computer system designed to satisfy the entire information processing needs of our selected industries.

Today there are over 170 "In*Sight" systems serviced by 14 sales/service branches. But more importantly, over 100 have been installed in the last year . . . and that's why we need help. We have grown over 100% each year of our existence and plan to continue the same growth rate over the next several years. Therefore, openings exist in all major U.S. metropolitan areas for the following positions:

Branch Managers

Effective, proven salesmen, demonstrators, and closers. Responsible for directing both sales and service personnel in a profitable branch operation. Highly motivated individuals with a desire to excell. Superior compensation plan.

Project Leaders

Proven ability to manage teams of installation representatives in coordinating customer training, support, and satisfaction. Experience in problem solving necessary, computer knowledge helpful.

Account Managers

Experienced salesmen willing to work hard developing prospects, presenting demonstrations, closing sales; and desiring excellent rewards and advancements.

Customer Engineers

Proven ability to diagnose and correct computer realated hardware problems. One year's field experience on mini systems, a customer oriented personality and aspirations for customer engineering management are characteristics of our customer engineers.

If you share our belief that customers and employees are the most important assets of a computer company, and you are the best at one of the positions mentioned above, please send your resume to:

Display Data Corporation

Executive Plaza IV
Hunt Valley, Maryland 2103Z 21031
Attn: Ms. Linda Garner

If you are that very successful Branch Manager or salesman that feels today may just be the day to make t step towards a change, please call:

Ms. Linda Garner

(301) 667-9211 or (800) 638-8665 (ext. 269)

BIG ENOUGH FOR YOUR LIFETIME CAREER

Since its founding in 1962, Kranzley & Co. has been involved with the design and implementation of proprietary application systems with major emphasis in banking. Kranzley & Co.'s systems are now installed and operating at scores of the nation's leading banks and financial institutions.

In addition to the application systems, Kranzley & Co. provides a series of computer programs for virtually all aspects of communication network analysis and design. The Company's broad background and involvement in these directions over the past ten years has provided the expertise and resources required to meet the exciting challenge of EFT Systems.

Consider Applications Programming

Three or more years COBOL programming experience. Banking or financial applications preferred. Solid self-starter.

Consider EFTS Involvement

Three to five years of strong Assembly programming. Mini exposure helpful. Operating Systems internals. On-line experience. Heavy communications background.

Consider the Leader . . .

Kranzley & Co.

1010 South Kings Highway
Cherry Hill, New Jersey 08034
609 795-1515

AN EQUAL OPPORTUNITY EMPLOYER

GROW WITH CUMMINS

Rapid growth in our Data Systems Division has created career opportunities in marketing and systems support for our family of dispersed processing systems.

SALES REPRESENTATIVES

Kansas City • Houston • Denver • Seattle • Orlando
The Carolinas • Boston • New York City • Michigan

Part of a nationwide sales team calling on top level management in banks and industry. Three years EDP equipment sales preferred; key-disk or scanning experience helpful. Exceptional income opportunity, salary, bonus, expenses, car.

PROGRAMMER /ANALYSTS

Chicago • New York City

Positions open in a Data Entry real time mini-computer environment including disks, tape, printers, CRT, MICR reader/sorters and optical scanners. The position involves customer support with Key-disk and scanner/sorter application design, format programming with conversational languages and RPG II programming. Salary commensurate with experience.

FIELD ENGINEERS/TECHNICAL SERVICES

Ohio • Minnesota • Wisconsin • New York City
Chicago and other Midwest Cities.

Challenging positions for field engineers with a minimum of three years experience with mini-computer based data entry and dispersed processing systems. Applicants should have experience with check processing systems and/or optical scanning devices. Salary commensurate with experience.

SOFTWARE TECHNICAL WRITER

Chicago

Preparation of user's software manuals and bulletins. Experience in EDP software technical writing required. Salary commensurate with experience.

TRAINING for all positions provided at our home office in suburban Chicago.

Send resume with full salary history to Ann Kane.

CUMMINS
CUMMINS-ALLISON CORP.

800 Waukegan Road
Dept. C100
Glenview, Illinois 60025

an equal opportunity employer m/f

position announcements

**DIRECTOR OF
UNIVERSITY
COMPUTER CENTER**

Minimum of three years managerial experience with disc environment and on-line data base network. Must have experience also in designing and implementing college-oriented systems. Computer Center has recently installed Burroughs B1715 System, has staff of eight, and in development stages. Qualified applicants must have college degree with preference to computer science or accounting. Excellent salary and fringe benefits inclusive of retirement, base medical, major medical, life, disability income, unemployment, and workmen's compensation. Salary range: \$20,000. Submit resume to:

Director of Personnel
Mercer University
1400 Coleman Avenue
Macon, GA 31207

**TECHNICAL
PROFESSIONALS**

Nationwide expansion in State-of-the-Art DB/DC systems has generated a demand for indiv's with tech. exp. in systems Software Data Base, T.P., and performance evaluation. Salaries to \$30,000. Contact Stan Durbas for details.

**ROBERT HALF
PERSONNEL AGENCIES**
111 Pearl St.
Hartford, Conn. 06103
(203) 278-7170

**PROGRAMMER
ANALYST**

Currently running a PDP 11/70 under RSTS/E using Cobol, Dibol and Basic plus. Minimum of two years experience in any or combination of the above. Cobol experience on other equipment may be substituted. Experience with COS 350 and COS 310 a plus.

Trent Tube Division is the world's leading manufacturer of welded stainless steel pipe and tubing. Based in a pleasant, rural community, 25 miles southwest of Milwaukee.

Please send resumes to the attention of vice president personnel.

**TRENT TUBE DIV.
COLT INDUSTRIES**

East Troy
Wisconsin 53120

An Equal Opportunity Employer

**PROGRAMMER/
ANALYST**

A multi-institutional, not-for-profit health care client, located in a suburban area of a major midwest city, seeks a person who can apply data processing resources to the professional service departments. A Bachelor degree or equivalent, systems analysis/programming experience, and familiarity with lab and x-ray operations technology can qualify you for this position which offers outstanding challenge and growth at a corporate level. Send complete resume and salary needs in confidence. No fee. D.J. Parsons Associates, Inc., 711 W. Devon Ave., Park Ridge, IL 60068.

SYSTEMS ANALYST

We are seeking an individual who preferably has a bachelors degree in Computer Science plus a minimum of two years experience in a systems and programming position. The individual selected for this position will be primarily involved interfacing automated systems and services regarding all aspects of Commercial Banking software applications. Prior hardware evaluation, systems software, and CIF experience a plus.

If you qualify, contact us today. Continued corporate growth and expansion has created many opportunities for you at Euclid National Bank.

Please send your resume and salary history in complete confidence to the Personnel Officer:

**EUCLID
NATIONAL BANK**

1255 Euclid Ave. Cleveland, Ohio 44115

An Affirmative Action Equal Opportunity Employer

**Programmers, are you distressed with
your present position?**

If there is any reason at all why your present position is less than exceptional, you need not suffer needlessly.

Right now, because of the incredibly high demand for your services, you can dictate what challenges you seek, where you want to work, who you want to work for, and how much you expect to be paid.

So don't despair. Just contact the NCA office nearest you... and find instant happiness.

**NATIONAL
COMPUTER ASSOCIATES****EDP Opportunities**

All fees paid. Positions nationwide, especially Southeast. This is a partial list of many available.

TO MIS DIRECTOR \$40K

Large SE financial institution. Image highly important. Must sell user and clients on use of computer. EFTS background, technically proficient. NCR experience a plus.

PROGRAMMER \$22K

SE bank. Software background. Two to three years experience in Telecommunications, IBM.

SYSTEMS ANALYST \$21K

MW bank. Strong programming experience in ALC/COBOL. General business background. Degree. Assist installation of design system. IBM.

PROGRAMMERS-P/A \$16K

One year experience. COBOL Assembler, Burroughs, IBM, OS, DOS, SE Banks.

Current employment will be protected. Send resumes including salary and relocation preference to Frank Parks (Banking/Insurance EDP) or Jim Stahl (Manager, Information Systems Division) to:

Whitlow & Associates
1190 Peachtree Rd. N.E. - Suite 418
Atlanta, Georgia
Telephone 404 262-2566

COMPUTER PROFESSIONALS

Let us know who you are, where you are and where you want to go. Our business is evaluating your career and determining your career pattern. Business application programmers, programmer/analysts are much sought after by our client companies (the largest state-of-the-art installations). Where do you fit in this booming marketplace? We'll tell you, that's our job! If you're the best at what you do, fill out and mail this coupon to us. Because we're the best at what we do! For immediate assistance call collect in Boston (617) 423-1900, in Houston (713) 961-5500 or in San Francisco (415) 981-7000.

**MANAGEMENT CONSULTANTS IN D.P.
ALL REPIES HELD IN STRICTEST CONFIDENCE**

NAME _____
ADDRESS _____ ZIP _____
HOME PHONE _____
COMPANY _____ TITLE _____

RETURN TO:
PERRI-WHITE ASSOC.
50 FRANKLIN ST.
BOSTON, MASS. 02110
(617) 423-1900
ATTN: CHARLIE WILKINS

PERRI-WHITE & ASSOC., INC.
5373 W. ALABAMA PLACE
HOUSTON, TEXAS 77056
(713) 961-5500
ATTN: TOM MEEHAN

PERRI-WHITE & ASSOC., INC.
220 SANSCOME ST.
SAN FRANCISCO, CAL. 94104
(415) 981-7000
ATTN: TERRY MC MAHON

**SALES
DP/SERVICES**

We are an expanding, innovative leader in the field of computer-based financial record keeping services presently offering new opportunities for over-achievers in the DP applications sales area.

If you are an aggressive, hard-charging, well-trained salesperson who has already realized great success and find new challenges limited, we offer limitless opportunity to achieve even greater success in selling systems and data processing oriented services.

Earn a highly competitive base salary as well as attractive commissions.

If you are interested in this immediate opportunity, submit resume in strictest confidence to:
BOX 919 CW
Suite 1207, 400 Madison Ave.
New York, N.Y. 10017
An Equal Opportunity Employer

**PRODUCTION
PLANNING
ANALYST**

Maryland's largest bank is currently seeking a career minded candidate for a position in production planning in our data center. Duties include scheduling work to be processed on the computer system and preparing various statistical reports. Qualifications include 6 months to 1 year IBM experience (preferably 370/158) with JCL and TSO, a good aptitude for statistics and some planning experience. We offer a good starting salary and excellent benefits. Qualified applicants should contact Kathy Ayres at 301/244-5929.



maryland national bank

225 N. Calvert St., Baltimore, Md. 21203

All inquiries will be handled in a confidential manner
An Equal Opportunity Employer M/F/H

**DATA PROCESSING
PROFESSIONALS**

Cutler-Williams, Inc., a national software services company, has immediate openings for Programmers, Programmer-Analysts and Systems Analysts in the Mid-West and nationally. We are looking for professionals with experience in the following areas . . .

**COBOL, PL-1, ALC, IMS,
CICS and MINI COMPUTER SYSTEMS**

We offer superior compensation, completely paid benefits, vacation and relocation. If you are interested in a key position in a progressive, successful company, that is doubling its revenues annually, send your resume or call collect:



**CUTLER-WILLIAMS,
INC.**

O'Hare Office Bldg. 2, Suite 509

Rosemont, IL 60018

equal opportunity employer M/F

SAN FRANCISCO

If you are planning a trip to the Bay Area, our clients are interested in discussing their available positions with you.

**CONSULTANT-DATA BASE
MGMT.** Should have solid 370/IMS background, with good Prog/Analyst exp.

COBOL PROGRAMMER/ANALYSTS Many of our IBM 370/OS, VS clients need qualified professionals with good track records.

Jerry Anderson

**ROBERT HALF
PERSONNEL AGENCIES**
111 Pine Street, San Francisco, CA 94110
(415) 434-1900

AUDITORS-EDP For our manufacturing, insurance and banking clients. Prefer Audit, Programming and Design exp.

MINI PROGRAMMER/ANALYSTS Hardware and software types for applications and software development.

position announcements

position announcements

position announcements

position announcements

position announcements

FIELD SERVICE MANAGERS

San Francisco & Houston Areas

A major manufacturer of video display terminals seeks Field Service Managers for their Houston and San Francisco areas. Will coordinate field support of installation, reconfiguration and repair of display terminals. The selected individuals will have a minimum of 3 years' experience in customer relations and will have a good background in digital logic, telecommunications and video display terminals. The San Francisco position will require travel in the Northern California and Pacific Northwest area and the Houston opening will travel the Southern area. Please send resume including salary history to:


LEAR SIEGLER, INC.

Electronic Instrumentation Div.

714 N. Brookhurst, Anaheim, CA 92803

An Equal Opportunity Employer M/F

Software Design Engineer

A highly responsible position is open in a new micro-processor systems development group. Qualified applicant should provide proof of experience in developing compiler and/or assemblers as well as knowledge of high level language and disc-based operating systems. Strong leadership ability is a necessity.

Tektronix, Inc. develops, manufactures, and markets electronic measurement instruments, computer peripherals, and related electronic instrumentation. Located near Portland, Oregon we are within a two hour drive of the Cascade Mountains and Ocean Beaches. The close-by nature playgrounds provide a variety of recreational and cultural interests.

Salary is open. Benefits include liberal insurance, educational support and profit sharing programs.

Send detailed resume and salary history to Mary Walhood, TEKTRONIX, INC., P.O. Box 500, C68, Beaverton, OR 97077.

An Equal Opportunity Employer M/F/H.

Tektronix
COMMITTED TO EXCELLENCE

IF YOU'RE AT WESCON CONTACT ROY EPPERSON IN THE SAN FRANCISCO AREA, 408/249-5500 FOR AN APPOINTMENT.

OUT OF THIS WORLD !

SSI, a leader in third party computer maintenance, is offering career opportunities for persons qualified to perform P&R maintenance on any of the following computer systems:

IBM 360/20,30,40 Systems

IBM 360/50,65 Systems

IBM 1401, 1620, Unit Record

DEC PDP 11/40 & 11/70

Burroughs, Honeywell, Univac

(All Systems)

If you possess two years or more experience, we want to talk to you. We offer outstanding benefits and growth opportunities in this exciting new field. Send your resume in complete confidence or call today.

SATURN SYSTEMS INCORPORATED
750 Lucerne Way
Sunnyvale, California 94086
408/732-4270 800-538-1737

SENIOR SYSTEMS PROGRAMMER

Southern Florida financial institution requires SENIOR SYSTEMS PROGRAMMER with indepth knowledge of NCR 300 and B-4 operating system. Supervise staff of three, provide technical advice and operating standards. All interview and relocation expenses paid. Send resume and salary requirements. Agencies invited to submit candidates.

CW Box 3169
797 Washington St.
Newton, Mass. 02160
Equal Opportunity Employer

Positions Available

Call toll free 800-426-0342

Programmers/Analysts To 18K
IBM 370/OS experience. Midwest location (not Chicago). Insurance background desirable.

Sr. Systems Analysts To 23K
OS/COBOL and on-line experience desirable.

Systems Programmers To 25K
Experience on 370/OS MVS

PARKER PAGE ASSOCIATES

P.O. Box 12308
Seattle, WA 98111
Offices: Seattle, Wash., D.C., Michigan, Atlanta

FIELD SERVICE

370/360, H-200,
SYSTEMS XDS, Univac, CDC
All Large & Medium
CPU's

MINI's PDP, NOVA, G.A.,
HP, etc. All Mini
Systems

I/O STC, TELEX, CDC,
ITEL, CALCOMP,
etc. All Peripheral Experience

MTR

(312) 547-6682
MTR ASSOCIATES \$12-24K
1107 Mannheim Road Westchester, Ill. 60153
Field Service Specialist
Nationwide Placement
Private Employment Agency
No Fees To Applicants

Manufacturers' Rep

Experienced computer-terminal sales representatives wanted by small but expanding systems house that engineers and manufacturers patented braille devices, printers and terminals. The fast-growing market for these devices in education, industry and government, both here and abroad, provides an excellent opportunity. Educational "mainstreaming" of handicapped students, as well as affirmative action programs, are stimulating demand for these devices. Generous commission arrangement. For more information, call Lee Brown, collect, at (813) 879-4452.

Triformation Systems, Inc.
3132 S.E. Jay Street
Stuart, Florida 33494

BUY SELL SWAP

USER OFFERS

SYCOR Terminals
(8) SYCOR 340D mini-computers with order entry and national communications network software with (2) diskettes and (2) cassette drives
Model 3585 120 CPS Printer

Paid \$18K - Sell \$10K each
Available 9/77 - 1/78

John Snyder
World Carpets
404/278-8000

WANT TO BUY FROM END USER

3135
3215
3046

CALL - DATRONIC
312-992-0760
WILL FOSS

REAL TIME PROGRAMMERS

M.I.S. INTERNATIONAL, INC. — an internationally known computer systems integration organization — requires specialized professionals for Michigan and Indiana branches.

Knowledge of the following computers is desirable:

- Real Time Analysts/Programmers with experience in Micro/Mini Computers: DEC, ModComp, T.I., G.A.
- Business Systems Analysts/Programmers with experience in COBOL/PL-1 on IBM, Burroughs and Honeywell main frame computers
- Data Base Management Analysts/Programmers with experience in IMS, DMS-II, IDS
- Scientific Programmers with time-sharing experience

Experienced men and women interested in furthering their career should consider M.I.S.'s top salary structure, stable employment environment, fully-paid fringe benefits, educational opportunities and relocation allowances. You are invited to send your resume to Mrs. M. Roseliep. Interviews will be arranged locally.

M.I.S. INTERNATIONAL, INC.

31350 Smith Road
Romulus, Michigan 48174
(313) 326-7010

buy sell swap

**New and Used
DEC EQUIPMENT**

DECdata System 354 (11/34)
8A400 BP System
2 PDP8E-DS Systems
50 LSI-11 (KD11-F)
Burroughs B1716 System
Serving the West
WESTEC
14040 NE 8th St.
Bellevue, WA 98007
(206) 641-7363

370/125's**For Sale * Lease * Purchase
* Purchase Leaseback**

Specialists in 125 Systems

**CORPORATE
COMPUTERS, INC.**

(203) 661-1500

115 Mason St., Greenwich, CT 06830

**BUY/SELL/LEASE/TRADE**IBM 360s, 370s, System 3s, all Peripherals
3830s, 3333s, 3340s, 3420s, 3803sPurchase/Leaseback 3277s Wanted
All types DEC CPUs and Peripherals
All types Unit Record Equipment

Call collect today (214) 634-2750

**METROPLEX COMPUTER COMPANY, INC.**
Suite 1208 Honeywell Bldg. 1111 W. Mockingbird Lane
Dallas, Texas 75247 TWX 910-861-4171**FOR SALE**

125 2740-2 Communications Terminals. Each has feature #1495, 248 position buffers; #1499, buffer receive; 3402, document insert; 4647, four wire line adapter; and 7106, speed base - 600 BPS. The State of Indiana will open sealed bids September 22, 1977. For further information on additional features and copies of bids contact:

Charles E. Woodard
Indiana State Data Processing Division
Room 1004, State Office Bldg.
100 N. Senate Avenue
Indianapolis, IN 46204
(317) 633-4690

SHORT OR LONG TERM LEASE**370/145 II**

SERIAL NUMBER 10460

Avail: December 1, 1977

370/155 II

SERIAL NUMBER 10132

Available: December 1, 1977

Jim Jamieson 804/643-4200

COMMONWEALTH COMPUTER ADVISERS, INC.
707 East Main Street
Richmond, Virginia 23219**BUY - SELL - LEASE
-BROKERAGE-**

Let the "Nations Largest Wholesale Dealer"

Buy, sell, lease, sub-lease, or be your agent in placement of your pre-owned IBM 360/370/System 3, or other units

COMPUTER INTERNAT'L LTD.

BEACH COMPUTER CORP.

CWC's Leasing Division

COMPUTER WHOLESALE CORP.

(504) 581-7741

Suite 507/508 First National Bank of Commerce Bldg.
New Orleans, LA 70112

Member Computer Dealers Assoc.

**FOR SALE
370/158 Features 1434, 1435, 1850****Available immediately**

2-3330-1 Disk Drives - Available October 1st.

3-3330-11 Disk Drives - Available immediately.

Contact George Prussin

O.P.M. Leasing Services, Inc.

99 Wall Street

New York, New York 10005

(212) 747-0220

out of state call (800) 221-2674

LEASE • BUY • SELL**360/370 CPUs & PERIF.****FOR SALE • AVAILABLE NOW****CAL-COMP****2- 1144 CONTROLLERS****4- 244 DISKDRIVES**

EFM Computer Leasing, Inc.

3000 marcus avenue

lake success, ny 11040

(516) 488-7876

**FORSYTHE
MCARTHUR****Dealer &
Lessor in
IBM
Computers**919 North Michigan Avenue
Chicago, Illinois 60611
(312) 943-3770

Member, Computer Dealers Assoc.

WANTEDALL 360/370 SYSTEMS AND SYSTEM/3
AND PERIPHERALS

WE BUY • SELL • LEASE • TRADE

transdata

P.O. Box 47762 Dallas, Texas 75247 PHONE (214) 631-5647

---IBM 158---

We are going to purchase a 158% Meg-4 Channel for January delivery. We will purchase from submitted offers. If you have the equipment and really want to move it, send your best cash price the first time to:

Preferred Municipal Funding
5586 S. Emporia Circle
Englewood, Colorado
(303) 773-1757

3125-2 H2/256K w/appropriate features

3340A2 1442N1 RDR/Punch

3340B2 3203-2 1200 LPM

Shipped, IBM installed,

LESS THAN \$7,000 MONTHLY

w/IBM maintenance INCLUDED

Above Units Also Available Individually

Also available: 3540B1 Diskette I/O Unit

CAC, INC. 901-761-2766

1355 Lynnfield Rd., Suite 245

Memphis, Tennessee 38128

**For Sale or Lease
370/125 SYSTEM****IBM 370/125****Configuration****AVAILABLE IMMEDIATELY**

3125-H00

Processing Unit

4650 3203 Printer Attach.

4680 Int. 3504 Attach.

4685 Int. 3525 Punch Attach.

4693 3525 Card Print Control

3125-4675 Mag Tape Adaptor

For Further Information Contact Mr. J. Rogers

TORONTO HYDRO

14 Carlton St.

Toronto M5B 1K5

(416) 595-6433

**TO BUY
SELL, OR LEASE****CALCOMP
DISKS**

1030/230 (3330)

1015/215 (2314-D.D.)

CD 14/CD 12 or 22
(2314-S.D.)Write or Call
Gene Wendt

(913) 631-2992

CompuMart, Inc.

6622 Black Swan Dr.

Shawnee Mission, KS 66216

**BUY
SELL
LEASE**
Peripherals & I/O
3330's 3410's 3211's
3340's 3420's 3505's
3350's 2401's 1403's
2314's 2501's

CIS
CIS Corp.
600 Mony Plaza
Syracuse NY 13202
(315) 425-1900
Telex: 93-7435
**XEROX SIGMA 9
MODEL 3**

Xerox Sigma 9 Model 3 with 96K words of memory, 600 MB of dual access disk storage. Other peripherals are:

1 7140 Card Reader
1 7315 Tape Drive & Control
1 7316 Additional Tape Drive
1 7440 Line Printer
1 7630 Comm. Cont. w/8 lines
3 7631 Comm. Extens. w/8 linesAsking Price Is
\$680,000

Call George Trowbridge

(505) 243-9781

**COM SYSTEM
for Sale
DATAGRAPHIX**4530 Com Recorder
16mm & Microfiche
156 C Processor
73V Microfiche Duplicator**3 YEARS OLD**

\$55,000

Terry Daffron

615-267-9184

**PROFESSIONAL
SYSTEMS INC.****For Sale Or Lease
System 3/15
Complete Systems**

Any configuration from B 19 to D 24

30 to 90 days delivery depending

upon your requirements.

Also complete inventory tapes — disks.

Printers — CPU Upgrades

**Call Avery Reynolds 214-630-6700
TWX 910-861-4936**Pioneer Computer Marketing
1165 Empire Central
Dallas, Texas 75247

Member of Computer Dealers Association

buy sell swap

Wanted to buy**System****3/10 or 3/6**

Principals only. No brokers.

Call

Rotor Clip Company

(201) 469-7333

187 Davidson Ave.

Somerset, N.J. 08873

wanted**DISC PACKS****DATA MODULES**

All Types Required

Call Lorraine

(312) 421-2900

**EXCLUSIVE
SUBLEASES**

370/135 Univac 9480

360/75

360/20

FOR SALE

Calcomp 1x4 2314

3540 Diskette.

Unimark

10520 Barkley Overland Park, KS 66212

(913) 649-2424

FOR SALE:

Best offer, twenty-five (25) used A.J. Model 841 terminals w/TC 26 mobile stand w/side and rear shelf, and LDA-1 limited distance line adapter. Also, one (1) used IBM 557 Interceptor, terms, "As is where is."

Call

Boston University

Paul Coughlin 617/353-4372

FOR SALE OR LEASE**370/148****Order Positions**

Contact George Prussin

O.P.M. Leasing Services, Inc.

99 Wall Street

New York, N.Y. 10005

(212) 747-0220

out of state call 800-221-2674

CAIL FOR BID
Sealed Proposals to Purchase or 36 Month Lease an
IBM S370/135 CPU
(Model FE Preferred)

will be received at the office of the
City of Tacoma, Dept. of Public Utilities
Purchasing Division, P.O. Box 11007
Tacoma, Washington 98411

BIDS WILL BE RECEIVED UNTIL:

3:00 p.m., Monday, September 26, 1977, at which time they will be opened.

Each bid must be accompanied by a Certified Check or Bid Bond in an amount equal to 10% of the Proposal.

Plans, Specifications, Proposals, Contract, Bond, and Affidavit forms may be inspected and obtained by intending bidders at the Public Utilities Building, P.O. Box 11007, Tacoma, Wash. 98411, or by phoning 593-8249.

The City reserves the right to reject any and/or all bids, waive technicalities or irregularities and to accept any bid it determines to be in the City's best interest.

FOR SALE
I.B.M. 370/138

MODEL J 1 MEG

4640 Integrated Comm. Adapter
4655 3340 Adapter
4722 Second ICA Line

3046 Power Unit

10% OFF IBM
CURRENT LIST PRICE
AVAIL. OCT. 1977

Please Call

Dan Watson (502) 491-4000
BRAMCO, INC.P.O. Box 32230
Louisville, KY 40232**For Sale**Entrex 480 System 64K
CPU, 4.8MB Disk, BSC
Communications, 800
BPI Tape, 5 Data Terminals.We can arrange
financing.Write or call
Charles E. LecknerChesapeake
Physicians, P.A.4940 Eastern Avenue
Baltimore, MD 21224

(301) 342-5700

**Surplus DEC And
Data General
Hardware**

For Sale

(305) 272-8753

Thomas Business Systems, Inc.

BUY-SELL-TRADE IBM EQUIPMENT**IBM 360/50 Core for Sale**

Data Recall: 256 to 384KB
IteI (AMS): 256K to 512K
IBM: H to HG, H to I and HG to I
Standard Memories: 256 to 512K,
512 to 768K and 512K to 1Meg

CALL DICK BAKER (305) 561-5207

dataware
incorporated

Intracoastal Building
3000 NE 30th Place, Suite 309
Fort Lauderdale, Florida 33306
Telephone (305) 561-5207



call... **the Matchmakers** 1-800-654-9179 TOLL FREE!

BUYING•SELLING•LEASING•TRADING

CSA COMPUTER SALES INTERNATIONAL, INC.

buy sell swap

IBM UNIT RECORD EQUIPMENT

024 077 085 402 514 552 026
 082 087 403 519 557 029 083
 088 407 523 602 056 084 089
 408 548 604 029 129
 We Buy Sell or Lease
 360s 1400s 1440s

IBM COMPUTERS

2040 GF, I/O Set
 5 Spindle Calcomp 2314
 6-60KB Tape Drives/Sims
 8-1440 Disc Systems at \$4,000
 16K 1460 Systems with 1403-3
 2803-2 and 2401-6
 1401 Disc Systems
 360/30's & 40's
 any configuration

Big Savings on certain items of Equipment

Call us for all your needs; we buy rent and sell all types of IBM unit record equipment. Over 12 years of serving commercial and government requirements. Contact ACS for proposal.

7126 Mullins
 Houston TX 77036
 (713) 666-2122
 TWX 910-881-1526

EQUIPMENT CORP.

OEM Demonstrator System FOR SALE

Hewlett Packard
 3000 Series
 II MOD 6

New equipment tax credit HP performed installation and warranty — application software also available.

CMC ASSOCIATES

755 Boylston St.
 Boston, MA 02116
 (617) 266-4933

370/168 FOR LEASE

Available December

Call or Write:

COMPUTER INDUSTRIES INC
 3570 American Drive • Atlanta, Georgia 30366
 404/451-1895 • TWX 810/757-3654

CHICAGO 312 298-5650
 WASHINGTON 703 525-3074
 LOS ANGELES 213 377-3844

CMI BUY LINES**BUY-SELL-LEASE-TRADE****370/165 370/168**

Call Bob Van Hellemon
 (313) 642-8000

360/20

1130
 Call Jim Carleton
 (313) 642-8000

System/3

Model 15
 Call Jerry Roberts
 (313) 642-8000

370/145-158

Call Ron Baker
 (313) 642-8000

370/155

Call John Mills
 (313) 642-8000

370**115/125/135**

Call Pam Hoban
 (313) 642-8000

360/30 360/40**360/50 360/65**

Call Gary Smith
 (313) 642-8000

1403's 2821's**2501's 1442's****1443's**

If you rent any of the above and are sending back to IBM call me. I'll show you how to make money using your rental credits. We also buy owned equipment and sell all of these units.

Call Kathy Housey
 (313) 642-8000

IN CANADA
IBM 360 370

System / 3
 Buy-Sell-Lease
 Call Don DuPuis
 CMI Company
 P.O. Box 893
 Windsor, Ont.
 N9A 6P2
 (519) 258-8910

3420/s 3803/s**3333's 3830's****3330's 3340's**

Call Darryl Hastings
 (313) 642-8000

3742's**3741's****5496's**

Call Jerry Sharon
 (313) 642-8000

3270 CRT's

Printers/Controllers
 Call Jim Carleton
 (313) 642-8000

129-029-059-026**QUANTITY**

1 I.B.M. 370/158K-Available 12
 1977 - For Lease 1,2,3 & 4 Years

2 I.B.M. 3333-II-Available 11
 1977 - For Lease 1, 2 & 3 Years

6 I.B.M. 3330-II - Available 11
 1977 - For Lease 1, 2 & 3 Years

1 A.M.S. 145 Memory 3/4 Meg
 Available Immediately - For Lease
 1, 2 & 3 Years

1 A.M.S. 224K 135 Memory
 Available Immediately - For Lease
 1, 2 & 3 Years

3 Data 100 Terminals - Model
 701, Model 76, Model 78 Available
 Immediately - Short term leases available

Call Terry Schadoff or Phil Norton
 (703) 821-8770, Federal Leasing, Inc., Suite 610, 1970 Chain Bridge Road, McLean, Virginia 22101.

WANTED
OLIVETTI
P603 (s)
NCR
399 (s)

Unique Business Systems
 20245 W. 12 Mile Road
 Southfield, Mich. 48076
 (313) 356-8700

FOR SALE**NCR CENTURY 101**

Type/Model	Description
615-101	Processor (16K)
6101	I/O Writer
682-101	Card Reader (300 CPM)
649-300	Printer (300 LPM)
656-102	Disc Unit
6561	Disc Unit Controller
6562	Fixed Disc

call or write:

Ronald L. Dewey

Erdie Perforating Co., Inc.
 P.O. Box 1568
 Rochester, N.Y. 14603
 (716) 247-4700

FOR SALE/SUB-LEASE

- IBM 370/148 Processor
- 3047 Power Unit
- (3) 3286 66 CPS Printer
- (2) 3203 Printer
- 2501 Card Reader
- (2) 1416 Interch Train Cartridge
- 3340 Disk Storage & Control
- (2) 3344 Disk Storage Fixed Head
- (4) 3348 Data Module
- 3411 Mag Tape Unit & Control
- (2) 3410 Mag Tape Unit
- 3704 Communications Controller
- 3271 Remote Control Unit
- (8) 3277 Display Station
- 3272 Local Control Unit
- 029 Card Punch

ALL EQUIPMENT IMMEDIATELY AVAILABLE

IN UNUSED CONDITION

WRITE ON COMPANY LETTERHEAD
 FOR FULL LIST OF FEATURES TO

CW BOX 3167

797 Washington St., Newton, Ma. 02160

BUY • SELL • LEASE • TRADE**SYSTEM/3 370/115 370/125**

(ALL MODELS)

360/20**1130**

ECONOCOM

MEMBER: COMPUTER DEALERS ASSOCIATION

FOR SALE**New System**

PDP8A620 32K Memory
 3 RK05's
 6 VT52's
 1 LE8VA printer

Call: Ms. Zwygart
 Star

Telecommunications
 617-275-2006

DATA GENERAL 840 COMPUTER

MMPU, PWR-FAIL, AUTO-RESTART, MUL/DIV, 40 KB MEMORY, IO CABLES INCLUDED FOR: PRINTER HS READER/PUNCH, 4057 DISC, TTY, QTY.

Available After Oct. 1

Call Tom Mosco
 (603) 893-4552

THERE ARE MANY

ALTERNATIVES

TO THE IBM

138-148-158-168

LEASE PLANS

AND WE OFFER THEM ALL

We Also Lease All Other 370 Equipment.
 Will Purchase Your On Order Position!!!

National Computer Rental

415 Madison Avenue

New York, New York 10017

Tel. No. (212)532-1500

buy sell swap

**WE WANT TO BUY**

158's any configuration
155's, 145's, 135's
3420's all models

IPS Computer Marketing Corp., 2460 Lemoine Avenue, Fort Lee, N.J. 07024

FOR SALE OR LEASE**145-12**

two available with ISC's in Oct. & Dec.

135HG

with IPA, ISC available in Nov.

360 CPU's

40's and 50's available now

I/O Sets

1403's, 2821's, 2540's available immediately

155J-II

available now with or without DAT. Also 3360's and model changes.

3420-5's & 7's

with controllers available Sept.

IBM MEMORY

155, 145, 50 and 40

158 ISC

available immediately



BUYING SELLING LEASING

360/40	370/145	370/135
360/50	370/158	370/155
360/65	370/168	370/165

TAPES / DISKS / CORE

Pioneer Computer Marketing
1165 Empire Central Place
Dallas, Texas 75247

214/630-6700

SELLING

PREVIOUSLY OWNED EQUIPMENT
N.C.R., BURROUGHS, OLIVETTI

N.C.R. 31, 32, 490, and 152-47 & 152-70 TELLER UNITS
N.C.R. 735/736 MAGNETIC TAPE ENCODERS & LINE PRINTERS
N.C.R. 299, 399, & 499 MINICOMPUTERS and CENTURY SYSTEMS

BURROUGHS "L" 3000 THRU 9000 SERIES & TC'S
(W/WO PERIPHERALS) also B-700 THRU B-4700 SYSTEMS
OLIVETTI "P" and "A" SERIES

WE ARE AUTHORIZED N.C.R. DEALERS OF
210 ECR'S, SYSTEMEDIA, & MICROGRAPHIC PRODUCTS

BUYING OR SELLING - CALL US FIRST!

KEY-EXPORT CORP.

256 LIVINGSTON ST. (P.O. BOX 129) NORTHVALE, N.J. 07647
TELE: N.J. (201) 767-3444 N.Y.C. (212) 736-7736
TELEX 135149 CABLE KEYEXIMP NORTHVALE NJ

BUYING

**370/138-370/148
AVAILABLE FOR SALE**

Type	Shipment Date	System Number
3138	10/21/77	0000794
3138	12/30/77	0000797
3148	10/07/77	0000807
3148	12/16/77	0000810

Jim Jamieson (804) 643-4200
Commonwealth Computer Advisers, Inc.
707 East Main Street
Richmond, Virginia 23219

Before you buy or lease... take a second look

**BUY - SELL - LEASE**

360/30 - 360/40 - 360/50 - 360/65

IBM PERIPHERALS

370/135	370/145	370/155	370/165
370/138	370/148	370/158	370/168

ANY CONFIGURATION

COMPUTER INDUSTRIES INC.

3570 American Drive • Atlanta, Georgia 30366
404/451-1895 • TWX 810/757-3654

CHICAGO - 312/298-5650
WASHINGTON - 703/525-3074
LOS ANGELES - 213/370-4844

O.A.C.**IBM 360/370**

also
Unit Record Equip.
OLIVER-ALLEN CORP.
110 Hi Vista Rd.
Sausalito, CA 94965
(415) 332-6262
Member Computer Dealers Assoc.

DISK PACK REPAIRS

2315, 5440	\$35.00
1316	\$35.00
2316	not to exceed \$75.00
3336-1	not to exceed \$200.00
3336-11	not to exceed \$400.00

NEW PRODUCTS

Diskettes	\$3.65 ea.
2315, 5440	\$62.50 ea.
Storage Modules (3348-70)	

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

8416 \$450.00 ea.

8418 \$500.00 ea.

V R DATA CORPORATION

(609) 365-2400

1100 Wright Ave.,

Camden, NJ 08103

1295.00

T-80 \$450.00 ea.

9877 \$450.00 ea.

buy sell swap

dataserv

buy • sell • lease • trade

370
115 and 125
Steve Lacny
800-328-2406

For Sale or Lease
Any 115/125 configuration
Selling 115/125
Back to IBM
Call us! We'll show
you how to make money
using your rental credits.

370
135 through 168
Dave Miller
616-637-8481

For Sale or Lease
135 - 145 - 155
CPUs — Peripherals —
Memory
We'll Buy
Any 370 CPU
Wanted
Your 370 CPU for sublease

370
Peripherals
800-328-2406

For Sale or Lease
360/30 - 40 - 50 - 65s
CPU — Peripherals —
Memory
We'll Buy
Any 360 CPU
IBM Peripheral
Non-IBM Perph/Memory

360
CPUs and Peripherals
Neal Johnson
800-328-2406

For Sale or Lease
3211/3811 3340/A2,B2
3272/3277 3410/3411
3330/3333 3420/3803
STOP! Before you send
any of the above machines
back to IBM call us. We'll
show you how to make
money.

SYS/3
CPUs and Peripherals
800-328-2406

For Sale or Lease
5406 - 5410 - 5412 - 5415
CPUs — Peripherals —
Memory
We'll Buy
Your 5406/5410
5415 — Rental credit
machines
Peripherals — Memory

Call Toll Free 800-328-2406
or 612-544-0335

Or write: Dataserv Equipment, Inc., 9901 Wayzata Blvd.
P.O. Box 9488, Minneapolis MN 55440

GO GREYHOUND



WHEN
BUYING OR SELLING
COMPUTER EQUIPMENT

For Sale

370/145 H2
360/50 H

Want to Buy

IBM 3803-1 and 8 3420-7's
2-3420-3's IBM 145 IH2J Core

U.S.
Home Office
New York
Chicago
Dallas
San Francisco

T.A. Takash
Dick Ventola
Pete Ahern
M.W. "Bill" Tucker
Henry Paulson

(602) 248-6037
(914) 949-1515
(312) 298-3910
(214) 233-1818
(415) 283-8980

Non-IBM

Canada
U.K./Europe
Mexico
Austro-Asia
Eurasia
Dallas

Don Maunder (Toronto)
Joe Gold (Geneva)
Andres Contreras
John Hallmark (Dallas)
Don Haworth (Dallas)
John Hallmark

(416) 366-1513
(022) 61-27-54
(905) 543-6850
(214) 233-1818
(214) 233-1818
(214) 233-1818

Greyhound Computer Corporation Greyhound Tower Phoenix, Arizona 85077

WANTED

FOR SALE

(2) 3420-8
Avail. Dec. 77
3330-11, 3333-11
(2) new DEC II T 34 System
IMMED. AVAIL.
WANTED TO BUY

3271 Controllers
3277 Terminals
3741 Data Systems
3410, 3420 Tape Drives


381 LAFAYETTE ST. N.Y. 10003
212-671-9300

DEC BROKER IN NEW & USED DEC COMPUTER SYSTEMS & COMPONENTS

FOR SALE
11/60-CPU, RP04, M8357,
M7258, M7850, KG11A,
DL11WB, BA11KE,
VT52AA, DDS310, 324.
C.D. SMITH
730 N. Post Oak Rd. #301
Houston, TX 77024
(713) 686-9405

BUY-SELL TRADE

For Computer
Call Action Write

CAC
404/458-4425 P.O. Box 80572
Atlanta, Ga. 30366

Need Standalone RJE, or TSO ?

IBM 370/158
3 Megabyte
6 Channels
10 3330's Mod 1
4 3350's
6 3420 Mod 7
Contact:
Bill Wieczorek
at (312) 431-5648 or
Tom Swiss at
(312) 431-5643
Chicago, Illinois

370/145 FOR LEASE

Immediate Availability

1/2 Meg

Contact

Don Blough

The Gap Stores, Inc.

875 Mahler Road
Burlingame, Ca. 94010
(415) 692-5450

WANT TO BUY

IBM 3271-2

IBM 3272-2

FOR SALE

024	084	419	552	*2402
026	085	514	557	*2403
029	088	519	602	*2405
056	089	521	604	*2406
077	402	523	824	7330
082	403	526	826	
083	407	548	867	

(* Potter)

Call Warner Rivera
at (212) 557-3712


an MAI company

300 East 44th St., New York, NY 10017

WANTED TO BUY

IBM 370/155

with or without DAT

Contact: Harry Blair

(713) 524-8249

WANTED

145 I2 - IH2 IBM MEMORY
For September/October
Delivery

Lou Skavienki
(315) 425-1900
Telex: 93-7435



CIS Corp.
600 Mony Plaza
Syracuse, N.Y. 13202

BUY ★ SELL ★ LEASE

DEC 11/70, 11/60
11/45, 11/50
11/34, 11/04

CALL US TODAY!

DATA GENERAL

**Nova 2, 1210, 820
SYSTEMS/PERIPHERALS**

4084 Dual Cassette Special

AMERICAN USED COMPUTER

CORPORATION

617-261-1100



Member
Computer Dealers
Association

PO Box 68, Kenmore Station, Boston, MA 02215

buy sell swap

IBM PROCESSORS & PERIPHERALS

IBM PROCESSORS

SELLING: 370/155J02-DAT Oct. 1
370/165KJ2-DAT Oct. 15
370/145IO2 Dec. 1

BUYING: 370/158 370/168 370/165
370/155 370/145

LEASING: 370/158KJ Nov. 1, 36 mo lease
370/168KO Sept. 1, 24 mo lease
360/65, 2860-2, 2870-1 Now

IBM PERIPHERALS

3330-1, 11
3333-1, 11
3420-5, DD

3340 A2, B2
3830-2
3420-4, 5, 6

3330-1, 11
3420-3, 5, 7
3420-8

The Logical Choice



9701 W. Higgins Rd. Rosemont, Ill. 60018
(312) 698-3000

San Francisco
415/944-1111

Fort Worth
817/534-1774

New York
201/568-9666

Atlanta
404/256-5956

Minneapolis
612/854-8107

IBM UNIT RECORD EQUIPMENT

MACH.	LEASE	MACH.	SALE	LEASE	MACH.	SALE	LEASE	
024	\$ 300	\$20/Mo.	083	\$1800	\$60/Mo.	526	\$1400	\$70/Mo.
026	\$ 900	\$35/Mo.	084	\$2500	\$100/Mo.	548	\$1600	\$70/Mo.
029	\$1900	\$55/Mo.	085	\$1200	\$60/Mo.	552	\$1000	\$40/Mo.
046	\$1200	\$50/Mo.	088	\$2500	\$175/Mo.	557	\$3000	\$100/Mo.
047	\$1500	\$60/Mo.	402	\$1000	\$60/Mo.	Disc Packs		
056	\$ 200	\$15/Mo.	403	\$1200	\$70/Mo.	2316	\$ -- 89	\$5/Mo.
059	\$1400	\$50/Mo.	407	\$1500	\$80/Mo.	3336(1)	\$ 129	\$10/Mo.
077	\$ 450	\$25/Mo.	514	\$ 800	\$45/Mo.	3336(11)	\$ 199	\$15/Mo.
082	\$ 850	\$35/Mo.	519	\$1000	\$55/Mo.	3348(70)	\$ 950	\$40/Mo.

THOMAS COMPUTER CORPORATION
600 N. McClurg Court - Suite 4202
Chicago, Illinois 60611
(312) 944-1401

IBM BUY-SELL-LEASE

FOR IMMEDIATE SALE

3

MOD 15
B20 or B18

MOD 10
16K SYSTEM

1130 8K word SYSTEMS
16K word

FOR LEASE
3211/3811

SALE BUY
LEASE

145

AMERICAN USED COMPUTER
CORPORATION

617-261-1100

PO Box 68, Kenmore Station, Boston, MA 02215

Member
Computer Dealers
Association

WANTED

BURROUGHS 'L' Series
DEC & DATA GENERAL
Minis & Peripherals

NCR: 399 & 299

Boynton Business Systems
87 Route 208
Wallkill, N.Y. 12584
914-895-2007

MINICOMPUTERS & SYSTEMS

Don't waste company time or money

Check with us before you buy or sell

Brand New Data General

Nova 2/10 - Save 40%

Jumbo 1200 - Save 30%

Nova 3/12 - Immed. Del.

New & Used Dec Equipment:

PDP 11/04 - Immed. Del.

RK 05 - Immed. Del.

Many others New & Used

Tape Systems for DG

from \$3,900

WANTED

Minicomputer systems & peripherals.
Buyers waiting for many items.

MINICOMPUTER EXCHANGE

(408) 733-4400

TWX 910-339-9272

PROFESSIONAL
DEALER/LESSOR
OF IBM
COMPUTER SYSTEMS

Bob Russell
Jack Emery
Dave Hepburn
Paul Baillie

SYSTEMS MARKETING, INC.
200 E. Thomas Road
Phoenix, Arizona 85012
(602) 264-5600 Telex 667-334

SIM

DECPRINTER 1

(LA 180)

USED

3-9 MONTHS

90 Day Warranty Available

\$2300

**QUANTITY
DISCOUNTS**

RON MURPHY
(212) MU6-4000

SALE
DECprINTER I Model LA 180
HIGH SPEED PRINTER

\$2,850.00 ea.

Complete with EIA
Serial I/O Interface

\$2,500.00 ea.

You provide Interface

Full DEC Warranty

Terms:
Two weeks A.R.O.

F.O.B. Park Ridge, Ill.

CASH WITH ORDER

Also available: LA 36, LS 120,
VT 52, 1103, Diablo 1620, Cas-
sette & Floppy systems, TI 745,
TWX/DDD Alternates, TTY-43 &
Coupplers.

MANAGEMENT
RESPONSE CORP.
660 Busse Hwy.
Park Ridge, IL, 60068
(312) 698-3377
IN WATS (800) 323-2135

Mini Computers

Buy-Sell-Trade

For Sale

DEC CPU's

11/04 11/34 11/T04

11/05 11/35 11/45

11/T34-BA

DEC Disks

RK05 RF11-RS11

RP02 RX11BA

DEC CRT's

VT50HA VT05

VT52 VT20

DEC Memory

MM11L MM11DP

MS11JP

Misc. Modules

Hundreds Of
Miscellaneous Modules &
Cables Available

Call For Other
Components In Stock

For Sale

DEC

11/04-DC

DEC TJI16-EA

**Substantial
Discounts**

DATALEASE

700 North Valley Street

Anaheim, CA 92801

(714) 533-3920

TELEX 692439

ORDER YOUR

LA 36 DEC Writer II

PRINTER TERMINAL

at Heath's low, low

mail order price . . .

only

\$1495

Shipped Motor
Freight, prepaid
to your nearest
terminal within the
Continental
U.S. Include
phone number for
notification of arrival.

Arrangements for home delivery at extra

charge at your option. No C.O.D. orders.

Send check or money order to:

Heath Company, Dept. 367-330-

Benton Harbor, MI 49022

SOFTWARE

WANTED

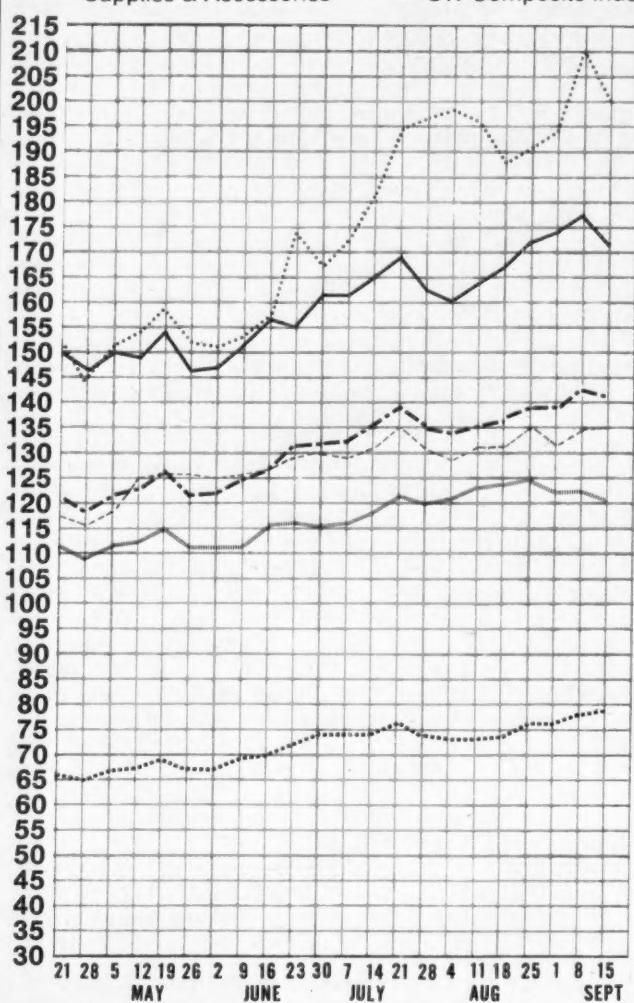
Accounting Packages

Southeastern Manufacturer has
requirement for General Ledger,
Standard Cost Accounting and
Accounts Payable Packages that
are written for a Honeywell OS
2000 system in ANSI COBOL.
Reply To:

CW Box 3165
797 Washington St.
Newton, Mass. 02160

software for sale	software for sale	software for sale	software for sale	time & services
<p>SAVE</p> <p>RPG/RPG II TO COBOL TRANSLATOR</p> <p>This package accepts all types of RPG and produces ANSI COBOL while approaching 100% error free conversion. The resulting COBOL program is modular in design and easy to read and maintain. Several client service options are available. Perpetual Lease, Conversion only, Clean Compile and full implementation including production JCL, test and installation. Over 100 satisfied customers.</p> <p>For Prompt Reply Write or Call Us Today</p> <p>Milwaukee, Wisconsin 53217, Suite 301, 8705 N. Port Washington Rd., (414) 351-2600</p>	<p>RPG II SYSTEMS</p> <ul style="list-style-type: none"> *A/R-OPEN ITEM OR B/F *ACCOUNTS PAYABLE *GENERAL LEDGER *PAYROLL AND LABOR DIST. *INVENTORY *CREDIT UNION MAILING, ETC <p>Extensive Documentation Provided</p> <p>Bancroft Computer Systems P.O. Box 1533, Dept. C West Monroe, LA. 71291 (318) 388-2236</p>	<p>the choice of</p> <p>MB</p> <p>Milton Bradley Toys</p> <p>ACCOUNTING IV GENERAL LEDGER</p> <p>Our software products—General Ledger, Accounts Receivable, Accounts Payable and Standard Cost—are the choice of leaders like Milton Bradley... not by chance, but by design. For details, call (213) 887-9121.</p> <p>informatics inc</p> <p>World's Largest in Software Products 21050 Vanowen St. Canoga Park, CA 91304</p>	<p>WE ARE BROKERS OF COMPUTER TIME</p> <p>New York & New Jersey Only Computer Reserves, Inc. (212) 687-1840 (201) 676-1881</p>	<p>Datacenter 370/158</p> <p>3 meg VS2 Specializing in Remote Job Entry and Batch</p> <p>Excellent Technical Support Very Attractive Rates Contact: Stu Kerevsky (212) 564-3030 Datamor 132 W. 31st St. New York, N.Y. 10001</p>
<p>Q.</p> <p>Where do I turn for the best software packages available?</p> <p>FREE SOFTWARE</p> <p>Why pay thousands of dollars for Payroll, Billing, Inventory, or Accounts Receivable software. Unlike other software cos. we don't believe in making all our profit off you! We have compiled a Library of Money-making, Money-saving! Advanced Business programs, all written in a language your computer will comprehend, BASIC. We also offer Games Eng, Stat, etc. For a little more than the price of the paper you could own tens of thousands of \$\$\$ worth of powerful software. Vol. III Ad. Bus. \$39.95. While they last. Add \$2 for hndl. plus postage. (Includes: A/R, Inventory, Payroll, etc. software) CASH/Ck/MO/MC/BAC * S.R.I. 1712C Farmington Ct., Crofton, MD 21114.</p> <p>ACCOUNTING SOFTWARE FOR DEC RSTS/E CTS-500 USERS</p> <p>From one of the pioneers in commercial data processing using RSTS. Successful installations in manufacturing, distribution, service bureau uses. Completely on-line, interactive systems. If you are installing or have installed a RSTS/E or CTS-500 system, contact us first for cost-effective solutions in: ACCOUNTS PAYABLE; GENERAL LEDGER; FINANCIAL REPORTING</p> <p>The design specifications for these packages were developed by accountants for use by accountants. All packages provide excellent audit-trail, extensive user prompting, fast data entry, full file-maintenance and inquiry capabilities, modular design and construction.</p> <p>These are consolidating packages and support multi-division company and multi-company corporate accounting functions.</p> <p>For more information, contact us at:</p> <p>(219) 936-2183 p.o. Box 160 plymouth, in 46563 Div. of Young Door Co.</p>	<p>TONE 3</p> <p>The only TSO for VS1</p> <p>Redesigned to eliminate TCAM and the staggering overhead of user swapping</p> <p>ISP (Intersystem Spool Processor)</p> <p>System-to-System Communication for VS1</p> <p>(Write or phone for details)</p> <p>TONE Software Corp.</p> <p>(714) 636-8501 11588 Trask Avenue Garden Grove, Ca 92643</p>	<p>RSTS/E</p> <p>SOFTWARE PACKAGES</p> <ul style="list-style-type: none"> • KDSS, a multi-terminal key-to-disk data entry system. • TAM, a multi-terminal transaction-processing "front end." • FSORT, a high-performance replacement for SQWIK & MQWIK. <p>(All three are implemented in assembly language as run-time systems for efficiency.)</p> <p>Evans Griffiths & Hart, Inc. 55 Waltham St. Lexington, Mass. 02173 (617) 861-0670</p> <p>RSTS/E PAYROLL</p> <p>Complete Payroll System</p> <ul style="list-style-type: none"> • MTD, QTD, and YTD totals for hours, earnings, taxes, and deductions • Unlimited deductions and distributions per employee • 14 system defined and 6 user defined deduction calculations • Piece work, direct labor, job costing, and G/L wage distribution • Complete array of comprehensive payroll reports • Most comprehensive payroll system available to RSTS/E users <p>Contact Jim Hodges Bloodstock Computer Services 1750 Alexandria Drive P.O. Box 4097 Lexington, Ky. 40504 (606) 278-0411</p> <p>OTS AN ECONOMICAL TSO</p> <p>3270 Local and Remote Batch Job Submit Full Screen Edit Facility - PDS and Sequential Files - PANVALET Interface - ADR LIBRARIAN Interface Data Set and Catalog Utilities</p> <p>HASP Commands & Print Interface Command Language Data Security and Logging User Task Facility Dynamic Data Set Allocation OS and VS</p> <p>JLB SYSTEMS 3930 SW Kanan Portland, Or 97221 (503) 248-1474 \$5000 - 250/month</p>	<p>SOFTWANTED</p> <p>Australian software company is seeking marketing agency for financial accounting and other market proven packages for the Australia/South Pacific region.</p> <p>We are an organization of D.P. professionals with a proven track record in the sale and support of application packages. We do not yet have any agency arrangements for US software products. One of our directors will be in the US during October/November to evaluate potential software products.</p> <p>If you are interested in profits from 'down under' send details of available packages and agency requirements to:</p> <p>Management Application Systems Pty. Ltd. 140 Arthur Street North Sydney Australia 2060</p> <p>TIME & SERVICES</p> <p>REMOTE JOB ENTRY</p> <p>PHOENIX-HECHT</p> <ul style="list-style-type: none"> • IBM 370/158-3 • Nationwide incoming Watts lines • Complete systems and software support • Full application Library (including all accounting applications) • All high-level languages • Prime time and off hours • VS 2, HASP, INTERCOMM, DYL-260 • Complete data security including off-site storage <p>For information call Walter Czerniak, (312) 861-7100</p> <p>PHOENIX-HECHT 233 N. Michigan Avenue Chicago, Illinois 60601</p>	<p>I.B.M. 360-40</p> <p>All Shifts 128K, 4-2401 MOD-2, 9-2314, 1403-N1, 2540, 1401 Compatibility. From \$35/Hour</p> <p>Restaurant Associates, Inc. 1540 Broadway New York, N.Y. 10036</p> <p>Contact: Al Palmo (212) 974-4966 Charles Leigey (212) 974-4967</p> <p>"TIME FOR SALE" MICRODATA REALITY 24K, 300 L.P.M., 10M/B, MAG. TAPE, 2 C.R.T.S</p> <p>Contact John Barry (714) 465-1398</p> <p>IBM 360/50</p> <p>ALL SHIFTS 384K, 3-2401V, 14-2314, 1403-N1, 2540, 3 sel. ch.</p> <p>VECTOR SYSTEMS CORP. University City Science Center 3624 Market St. Philadelphia, PA 19104</p> <p>Contact: LEO GENOVESE (215) 387-6500</p> <p>Whether you're buying, selling, swapping, hiring or looking, Computerworld's Classifieds work.</p> <p>Issue Date: Ad closing is every Friday, 10 days prior to issue date.</p> <p>Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)</p> <p>Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy.</p> <p>Cost: Our rates are \$49.70 per column inch. Minimum size is two column inches and costs \$99.40 per insertion. Extra space is available in half-inch increments and costs \$24.85. Box numbers are \$3.00 extra.</p> <p>Billing: If you're a first-time advertiser, we must have your payment in advance.</p> <p>Ad Size: _____ Issue (Date(s): _____ Section: _____</p> <p>Signature: _____</p> <p>Name: _____</p> <p>Company: _____ Title: _____</p> <p>Address: _____ Tel: _____</p> <p>Send this form to: Kathy Steinberg, Position Announcements or Frank Collins, Classified Advertising</p> <p>COMPUTERWORLD, 797 Washington St., Newton, Mass. 02160</p>

COMPUTERWORLD
 Computer Stocks Trading Indexes

 Computer Systems --- Software & EDP Services
 Peripherals & Subsystems Leasing Companies
 Supplies & Accessories ----- CW Composite Index


Earnings Reports

 ELECTRONIC TABULATING
 Six Months Ended June 30

 1977 1976
 Shr Endr \$.01 \$.51
 Revenue 1,765,071 1,743,728
 Earnings 2,427 218,728

 EMERSON ELECTRIC
 Three Months Ended June 30

 1977 a1976
 (000) (000)
 Shr Endr \$.65 \$.54
 Revenue 476,483 395,408
 Earnings 37,544 31,008
 9 Mo Shr 1.84 1.54
 Revenue 1,337,039 1,127,805
 Earnings 105,981 88,602

a-Restated for acquisition of companies on pooling-of-interests basis and for change in accounting for foreign currency translations.

 E-SYSTEMS
 Three Months Ended June 30

 1977 1976
 Shr Endr \$ 1.79 \$ 1.13
 Revenue 87,942,000 72,757,000
 Earnings 4,669,000 3,112,000
 6 Mo Shr 3.49 a2.04
 Revenue 176,602,000 142,255,000
 Earnings 9,129,000 5,582,000

a-Adjusted for 10% stock dividend in October 1976.

 FOUR-PHASE SYSTEMS
 Three Months Ended June 30

 1977 1976
 Shr Endr \$.62 \$.61
 Revenue 21,014,000 15,037,000
 Tax Cred 792,000 717,000
 Earnings 2,510,000 1,729,000
 6 Mo Shr 1.20 1.21
 Revenue 39,812,000 29,727,000
 Tax Cred 1,527,000 1,336,000
 Earnings 4,844,000 3,225,000

 FOXBORO
 Three Months Ended June 30

 1977 1976
 Shr Endr \$ 1.57 \$ 1.41
 Revenue 90,773,000 82,967,000
 Earnings 8,392,000 7,389,000
 6 Mo Shr 2.82 2.47
 Revenue 170,496,000 157,430,000
 Earnings 15,041,000 12,982,000

 Vice-President/Marketing
 Roy Einreinholfer
 Advertising Administrator

 Terry Williams
 COMPUTERWORLD
 797 Washington Street
 Newton, Mass. 02160
 Phone: (617) 965-5800
 Telex: USA-92-2529

 Boston
 Robert Ziegel
 Northern Regional Manager

 Mike Burman
 Account Manager
 COMPUTERWORLD
 797 Washington Street
 Newton, Mass. 02160
 Phone: (617) 965-5800

 New York
 Donald E. Fagan
 Eastern Regional Manager

 Frank Gallo
 Account Manager
 COMPUTERWORLD
 2125 Center Avenue
 Fort Lee, N.J. 07024
 Phone: (201) 461-2575

 San Francisco
 Bill Healey
 Western Regional Manager

 Jim Richardson
 Account Manager
 COMPUTERWORLD
 1212 Hearst Building
 San Francisco, Calif. 94103
 Phone: (415) 495-0990

 Los Angeles
 Bill Healey
 Western Regional Manager
 Jim Richardson
 Account Manager
 Judy Milford
 Account Coordinator
 COMPUTERWORLD
 1434 Westwood Boulevard
 Los Angeles, Calif. 90024
 Phone: (213) 475-8486

 Japan
 Mr. Shigemita Takahashi
 General Manager
 DEMPA/COMPUTERWORLD
 1-11-15 Higashi Gotanda
 Shinagawa-ku, Tokyo 141
 Japan
 Phone: (03) 445-6101
 Telex: J2424461

 United Kingdom
 Tony Vickers
 COMPUTERWORLD
 PUBLISHING LTD.
 140-146 Camden Street
 London NW1 9PF
 England
 Phone: (01) 485-2248
 Telex: UK-26-47-37

 West Germany
 Hans-Jürgen Ballnath
 COMPUTERWORLD GmbH
 8000 Munich 40
 Tristanstrasse 11
 West Germany
 Phone: (089) 36-40-36
 Telex: W.Ger-5-215250-HKFD

 All statistics compiled,
 computed and formatted
 by
 TRADE QUOTES, INC.
 Cambridge, Mass. 02139

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 14, 1977

	CLOSE PRICE					CLOSE PRICE					CLOSE PRICE			
	1977 RANGE (1)	CLOSE SEP 14 1977	WEEK NET CHNGE	WEEK PCT CHNGE	X C H	1977 RANGE (1)	CLOSE SEP 14 1977	WEEK NET CHNGE	WEEK PCT CHNGE	X C H	1977 RANGE (1)	CLOSE SEP 14 1977	WEEK NET CHNGE	WEEK PCT CHNGE
COMPUTER SYSTEMS														
O Amdahl Corp.	22- 44	40	-2	-4.7	O ADVANCED COMP TECH	1- 2	7/8	0	0.0	O DATA ACCESS SYSTEMS	4- 5	3 3/4	0	0.0
N Burroughs Corp.	55- 91	69 3/4	- 3/4	-1.0	O ANACOMP INC	7- 10	8 3/8	- 1/8	-1.4	O DATA 100	6- 9	8 1/8	+ 1/2	+6.5
O Computer Automation	18- 30	27 1/4	- 1/8	-3.9	A APPLIED DATA RES.	5- 10	7 5/8	- 1/8	-1.6	A DATA PRODUCTS CORP	9- 16	15	+ 5/8	+4.3
N Control Data Corp.	20- 26	20 1/2	- 5/8	-2.9	N AUTOMATIC DATA PROC	23- 30	25 3/4	-1	-3.7	A DATA TECHNOLOGY	3- 4	4 1/4	0	0.0
O Cray Research Inc.	15- 29	26	- 2 3/4	-9.5	O COLEMAN-AMERICAN COS	2- 2	2 1/8	+ 1/8	+6.2	O DATUM INC	1- 2	2	+ 3/8	+23.0
N Data General Corp.	35- 51	47 1/4	- 1 3/8	-2.8	O COMPU-SERV NETWORK	10- 15	12	0	0.0	O DECISION DATA COMPUT	2- 3	2 1/2	+ 1/8	+5.2
N Datapoint Corp.	18- 32	30 7/8	- 5/8	-1.9	O COMP ELECTION SYSTHS	6- 10	9	0	0.0	O DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
N Digital Equipment	37- 53	46 3/8	- 1 3/4	-3.6	O COMPUTER HORIZONS	1- 1	1 1/4	0	0.0	O DOCUMENTATION INC	6- 9	7	- 3/8	-5.0
N Electronic Assoc.	2- 3	1 7/8	0	0.0	O COMPUTER NETWORK	6- 10	9	- 1/8	-1.3	O DATARAM CORP	2- 8	7 3/4	- 1/4	-3.1
A Electronic Engineer.	8- 11	9 3/4	- 7/8	-8.2	N COMPUTER SCIENCES	7- 9	8 7/8	- 1/4	-2.7	N ELECTRONIC M & M	4- 5	3 7/8	- 1/4	-6.0
O Four-Phase Systems	13- 19	18 3/8	- 3/8	-2.0	O COMPUTER TASK GROUP	1- 2	2	0	0.0	O FABRI-TEK	1- 2	1 1/8	0	0.0
N Foxboro	42- 54	46	- 1 7/8	-3.9	O COMPUTER USAGE	1- 3	1 1/4	- 1/8	-9.0	O GENERAL COMPUTER SYS	0- 2	1 1/4	+ 1/8	+11.1
O General Automation	6- 9	7 1/8	- 3/8	-5.0	O COMSHARE	5- 7	7	+ 3/4	+12.0	O HAZELTINE CORP	9- 12	8 3/4	+ 1/4	+2.9
N GRI Computer Corp.	1- 1	1 1/2	0	0.0	O DATA DIMENSIONS INC	3- 5	5 3/8	- 1/4	-6.8	O HARRIS CORP	28- 39	36	- 1/5	-4.3
N Hewlett-Packard Co.	69- 87	78 1/2	- 1 1/2	-1.8	O DATATAB	1- 2	1 1/2	0	0.0	O INCOTERM CORP	10- 15	12	- 1/8	-1.0
N Honeywell Inc.	44- 55	46 5/8	- 1 5/8	-3.3	N ELECTRONIC DATA SYS.	16- 20	17 1/8	- 1/4	-1.4	O INFORUM INC	4- 7	4 3/8	- 5/8	-12.5
N IBM	245-286	263 1/8	- 4 3/4	-1.7	O INSYTE CORP	2- 3	1 5/8	0	0.0	O INFORMATION INTL INC	9- 14	11	- 1/4	-2.2
O Management Assist	5- 9	7	- 1/4	-3.4	O PTS COMPUTER MARKET.	1- 2	1 5/8	0	0.0	O INTEL CORP	38- 57	45 1/2	- 1	-2.1
O Memorex	23- 34	31 1/4	- 2 1/2	-7.4	O KEANE ASSOCIATES	3- 4	4	0	0.0	O LUNDY ELECTRONICS	3- 6	4	- 1/4	-5.8
O Microdata Corp.	7- 18	13 3/8	- 1/4	-1.8	O KEYDATA CORP	2- 3	2 3/8	- 1/8	-5.0	O MSI DATA CORP	6- 12	11 1/8	- 3/8	-3.2
O Modular Computer Sys.	5- 8	6 7/8	- 5/8	-8.3	A LOGICON	7- 17	12 1/2	+ 1/4	+2.0	O MOHAWK DATA SCI	5- 8	6 1/8	- 3/8	-5.7
N NCR	32- 47	45	0	0.0	A MANAGEMENT DATA	1- 2	2	0	0.0	O PENFIL CORP	2- 5	3 7/8	0	0.0
O Prime Computer Inc.	12- 23	21 7/8	- 1/8	-0.5	A NATIONAL CSS INC	19- 26	24	- 3/8	-1.5	O PERTEC CORP	7- 9	9 1/8	- 1/4	-2.6
N Perkin-Elmer	17- 22	20	- 5/8	-3.0	O NATIONAL DATA CORP	4- 7	6 3/4	+ 1/8	+1.8	A POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
N Raytheon Co.	16- 33	31	+ 1 1/4	+4.2	O ON LINE SYSTEMS INC	17- 22	16 1/2	- 1/2	-2.9	O PRECISION INST.	2- 2	1 1/2	0	0.0
D Sperry Rand	34- 42	34 1/2	- 1 3/8	-3.8	O PLANNING RESEARCH	3- 6	5 1/8	- 1/4	-4.6	O QUANTOR CORP	4- 5	3 1/2	- 1/4	-6.6
O Sycor Inc.	8- 15	11 5/8	+ 3/8	+3.3	O PROGRAMMING & SYS	1- 1	3/8	0	0.0	O RECOGNITION EQUIP	6- 10	8 3/8	- 1/2	-5.6
A Systems Eng. Labs.	5- 8	6 3/4	- 5/8	-8.4	O RAPIDATA INC	2- 3	2 5/8	0	0.0	O SCAN DATA	1- 2	1 3/8	0	0.0
A Wang Labs.	10- 14	13 3/8	- 3/8	-2.7	O REYNOLDS & REYNOLD	17- 20	19 1/2	+ 3/4	+4.0	O STORAGE TECHNOLOGY	10- 16	15 3/8	0	0.0
LEASING COMPANIES														
O Alanthus Corp.	3- 5	4 1/2	+ 1/4	+5.8	N ADDRESSOGRAPH-MULT	10- 15	13 1/4	- 1 1/8	-7.8	SUPPLIES & ACCESSORIES	6- 8	6 3/8	+ 1/8	+2.0
O Bootne Courier Corp.	8- 10	10 3/4	- 5/8	-5.4	O ADVANCED MEMORY SYS	7- 9	7 3/8	0	0.0	O AMERICAN BUS PRODS	2- 4	1 5/8	- 3/8	-18.7
O Condisco Inc.	10- 13	12	+ 1/2	+4.3	N AMPLEX CORP	8- 11	10 3/8	- 1/4	-2.3	O BALTIMORE BUS FORMS	10- 14	12 7/8	- 3/4	-5.5
A Commerce Group Corp.	2- 2	1 1/4	- 5/8	-33.3	N ANDERSON JACOBSON	3- 5	3 1/2	- 1/4	-6.6	A BARRY WRIGHT	1- 1	1	0	0

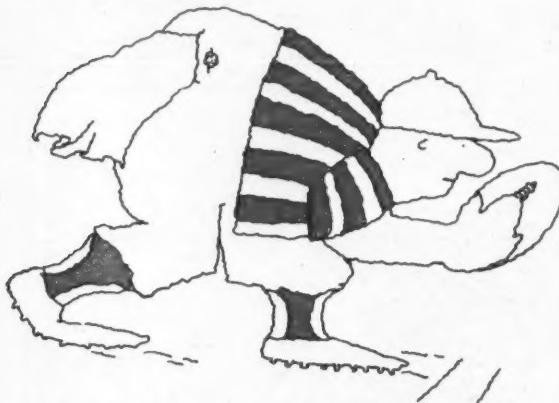
WIN

Fran Tarkenton's Super Bowl Tickets

Enter MSA's "Super Pool" and win a free trip to the Super Bowl. Free airline fare, free accommodations at one of New Orleans' luxurious hotels, and free tickets to the biggest game of the year, courtesy of Fran Tarkenton and MSA.



All you do is peer into the future and pick the winning team of each upcoming NFL Monday Nite Football game (plus one extra game to make things even), plus a tie breaker for the season. All are ABC televised games.



Circle the winners, do not pick ties, clip the entry blank and send to MSA Super Pool, 3445 Peachtree Rd., N.E., Atlanta, Georgia 30326.

"That's all there is to it."



710 FRANCE AVENUE SOUTH - EDINA, MN 55436 - (612) 920-4805

August 10, 1977

John P. Imlay, Jr.
President
Management Science America, Inc.
3445 Peachtree Road, N.E.
Atlanta, Georgia 30326

Dear John:

I'm going to send you eight tickets to this year's Super Bowl. Each NFL player gets an allotment and I thought you might put them to good use.

As you know, I really enjoy my association with MSA during the off-season. You've put together a great team and it's a pleasure working with them.

When you're Number One in anything, you can't let up a minute. And it's pretty obvious that MSA is the leader in the financial software industry. So your customers get the best of everything.

Hope you enjoy the tickets!

Sincerely,
Fran
Fran Tarkenton

Circle the Winning Team for Each Game.

Oct. 3 Oakland at Kansas City
Oct. 10 Los Angeles at Chicago
Oct. 17 Cincinnati at Pittsburgh
Oct. 24 Minnesota at Los Angeles
Oct. 31 N.Y. Giants at St. Louis
Nov. 7 Washington at Baltimore
Nov. 14 St. Louis at Dallas
Nov. 21 Green Bay at Washington
Nov. 28 Buffalo at Oakland
Dec. 5 Baltimore at Miami
Dec. 12 Dallas at San Francisco
Dec. 17 Minnesota at Detroit

Tie Breaker:

The team scoring the most points in any one of these games will be _____ Team

The game in which the most points will be scored will be _____ Date of Game

The number of points scored will be _____ Number

Send this entry blank to:

MSA Super Pool
3445 Peachtree Road, N.E.
Atlanta, Georgia 30326

Please Print

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Void where prohibited by law.

There will be one winner of a Super Bowl Trip for four, two winners of a trip for two, and twenty third place winners who will each receive a leather exhibition football, autographed by Fran Tarkenton.



Entries must be postmarked no later than Sept. 30. Facsimiles of the entry blank are acceptable, however, only one entry per person. An independent judging firm will announce the winners in late December.



So get busy, sports fans. Make your selections and send them in. Someone will win these glorious, fun-filled Super Bowl trips to New Orleans next January, and it could be you!



THE FINANCIAL SOFTWARE COMPANY

MSA markets financial accounting software packages including: General Ledger, Payroll, Personnel, Accounts Payable, Accounts Receivable, Supplies Inventory, and Fixed Assets